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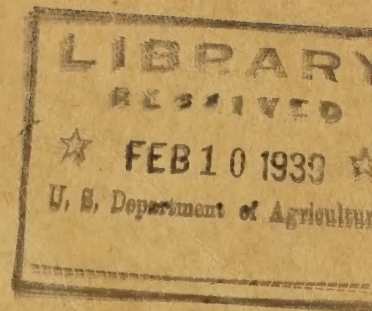
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UNDERSTANDING OURSELVES

A Survey of Psychology Today



A Series of Lectures at the Graduate School of
the United States Department of Agriculture
March - May, 1938

By

H. A. Overstreet

Arnold Gesell

Charles H. Judd

H. S. Langfeld

J. B. Rhine

Gardner Murphy

R. M. Yerkes

Daniel Starch

Adolf Meyer

Hornell Hart



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Edited by

Paul Kaufman
Lecturer in Psychology
The Graduate School



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GRADUATE SCHOOL

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Consultant in Commercial Research, New York; formerly

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FOREWORD

The Graduate School takes no little satisfaction in the publication of the following series of public lectures on Psychology presented before audiences of some five hundred persons earlier in the year. Previous series sponsored by the School on "Elements of Personnel Administration: Principles and Techniques" and on "Administrative Management," now available in printed form, are of special importance to many concerned with these professional subjects. The present volume is of broad interest in its survey of that science which is making such vital contributions to our understanding of human nature. In the search for solutions of our many urgent problems we must seek the guidance of exact knowledge provided by all the sciences. Yet all knowledge of the world of physical nature can avail us little unless we come to deeper comprehension of the world of our own personalities.

In so making accessible this outline of the most recent scientific study of human personality, the dual nature of the aim and program of the Graduate School, which is both professional and cultural, is concretely represented.

A. F. Woods
Director

The movements of the grown-ups, whom Georgie tolerated, but did not pretend to understand, removed his world, when he was seven years old, to a place called "Oxford-on-a-visit".

...Some grown-up or other tried to explain that the illusion was made with mirrors....Georgie did not know what illusions were....The "grown-up" was "just saying things" after the distressing custom of "grown-ups".

--Kipling, The Brushwood Boy

From the open mouth to the open mind is a long and toilsome journey in man's history.

--Edwin E. Slosson

The state of a man's mind is as much a fact as the state of his digestion.

--Legal maxim

It is as if we were prisoners in the vast palace of our consciousness, living confined to a small and bare room beyond which stretch the many apartments of our inner world, into which we never penetrate, but out of which mysterious visitors--feelings, thoughts, ideas and suggestions, desires and passions--come and pass through our prison, without knowing whence they come or whither they go.

--J. J. Van Der Leeuw, The Conquest of Illusion

The application of the experimental method to the problem of mind is the great outstanding event in the history of the study of mind.

--E. G. Boring

We cannot determine man's true estate until we know his true nature.

--G. Stanley Hall

Man alone of animals can, actually, acquire a trait by assuming, in defiance of reason, that he already possesses it.

--James Branch Cabell

Power keeps quite another road than the turnpikes of choice and will, namely, the subterranean and invisible tunnels and channels of life.

--Emerson

Dive deep into thy bosom; learn the depth, extent, bias and full fort of thy mind; contract full intimacy with the stranger within thee; and excite and cherish every spark, however scattered through the dull, dark mass of common thoughts.

--Edward Young (1759)

INTRODUCTION

Neither in science nor in industry do we often expect large-scale producers to act as their own "distributors"; generally we assume that the expert middleman plays an essential role in supplying the consumer. But sometimes in science the producer can become his own interpreter for the larger circle outside the laboratory or classroom. Then are we enabled to "share the wealth" more directly. Such was the privilege of the large and appreciative audience which listened to the lectures here preserved for a still larger audience of readers.

Addressing an assembly not of their professional colleagues but of the general intelligent public, each of these authorities condensed into an hour a whole year's course. Such an achievement, involving the reduction of intricate relations and technical language to lucid simplicity, will at once be recognized as the fine art of interpretation. And this sustained interpretation in itself would more than justify publication of the series, even if it paralleled previous surveys of a similar nature. But since no such comprehensive outline is available, the present publication makes a distinct contribution to the general understanding of psychology in those broad aspects of most concern to all of us.

Of all the greater value is this broadly sketched picture because of the compelling demand of our present confused society for the knowledge which psychology can reveal. Can any insight be as vital as the discovery of our own selves? As Dr. Starch affirms at the beginning of his address (p.79), "The greatest need

today is better understanding of human nature and a determined effort to use that understanding." No one will question the truth of the first half of this statement, or indeed the latter part, if the "use of understanding" be not limited to the self-centered advantage of the individual.

That this need is universally felt (though often dimly) appears in countless ways. Many are the kinds of service offered to promote the interests of business and industry; and many the practitioners ministering to human beings baffled and harried by their personal tensions --all in the name of psychology. Within two or three decades this name has come to wield a sort of magic. It has become a national obsession. No word of recent widespread acceptance, except science itself, is more irresponsibly invoked for every conceivable purpose. So it joins the company of noble words, like liberty, truth, love, --too often profaned. Could there be better proof that psychology has arrived?

Nor can we wonder that so sudden an arrival and so rapid advances on many fronts create doubt and confusion in the mind of the general public concerning the aims, results and applications of this new science. Someone has remarked that the only mysterious thing about psychology is the spelling of the word. But the problem is not quite so simple as that. The concerted experimental attack upon so puzzling an organism as a human being has inspired the invention of literally thousands of instruments

and devices for exposing the secrets of our behavior. Divergent and conflicting "schools" and theories have naturally developed. No wonder the innocent layman is bewildered by strange terms, by the clashing views of the specialists, and by startling conclusions that defy the cherished convictions of many centuries.

Small wonder, too, that a lurking suspicion attaches to so daring and subversive a "science". Perhaps, since after all we did conquer a continent and built big business and achieved all kinds of "progress" before the advent of this experiment, perhaps this science is only common sense -- what any man of observation and surely any woman knows -- only arrayed in the garb of technical language! Bertrand Russell has slyly intimated that psychology is the discovery by professors of what everybody else has known all along. Yet a glance at any standard text in our field will impress anyone with evidence that everybody has known an amazing number of things about human~~kind~~. that are not true.

Some of these are comparatively trivial, as, for instance, whether the eyes are more expressive than the mouth. Many others are vital, of the utmost individual and social importance. The discoveries of the nature of the learning process, overturning basic beliefs, are steadily working a revolution throughout formal education, while extensive research has quite exploded the popular belief that "You can't teach an old dog new tricks". This paralyzing fallacy, which has hung like a heavy pall over human advancement, is dispelled, and the "coiling" of our ability to

learn in mature years opens like the observatory dome of the astronomer.

Such a discovery in itself more than justifies all the patient labors of a small army of investigators, since the experimental method was launched in the exploration of our own nature scarcely more than a half century ago.

Other discoveries of major social import include the virtually unanimous consensus of conviction among the competent psychologists that such instincts as puerility are only bogeys of misguided imagination: the most exhaustive study of ourselves "when very young" fails to find such spectres. Even more fundamentally, psychology denies the dismal doctrine that "man is born to evil as the sparks to fly upward". It does not find us at birth either "good" or "bad", whatever these terms may mean. Psychology reveals us rather as indefinitely plastic and responsive to our environment,--creatures of infinite capacity.

So is this new science cutting broad highways through the ancient wilderness of error and ignorance, of habit and prejudice, however these are guarded by tradition and authority. And its progress constantly opens new vistas just beyond. To psychology as to no other science,

All experience is an arch where thro'
Gleams that untravell'd world, whose margin fades
For ever and for ever as we move....

Which does not mean that any one division of science is more important than any other. All science, as perhaps we do not fully

realize, is concerned with human experience alone. For all observation must be determined by the nature of the observing mind. "We see things not as they are but as we are." So must the science which describes us "as we are" take a central place among the other sciences.

A further significance in the current advances and universal interest in scientific self-knowledge lies both in a conscious and unconscious revolt against the threat of domination by the machine and against the speed which a "mechanized" society whirls us along. The story is told by an explorer of the Amazon River about a suggestive experience he had with the native porters. For three days he hurried them through the jungle by forced marches, but on the fourth day they refused to move. When he began to remonstrate, their chief explained that they had been going so fast that they had left their spirits behind, and that now they must wait for their spirits to catch up with their bodies. May not psychology prove the focus for a recovery of our own spirits?

The appeal of psychology, then, as so ably presented in the following pages, should be evident to all who wish to become better acquainted with themselves. Nor in taking the first steps are we left without definite practical guidance. Dr. Overstreet introduces several personality tests and pointedly recommends the personal history and the analysis of our habit systems. In the concluding "outlook for future discoveries", Dr. Hart, through

a striking experiment conducted with his original audience, shows us the simple method of "dividing our stream of consciousness", and so of illuminating the reality of our inner world, -- which may become more and more illumined for each individual who will search out the way for himself.

Thus are we summoned to the scientific exploration of our own individual natures, as well as to the intelligent analysis of other personalities. The resources available are abundant. We need no laboratory, except the laboratory of our own experience. No equipment is needed except our own deepening perception. And as we persist we shall move nearer to the goal of all human striving, the understanding and realization of ourselves.

Paul Kaufman.

Lecture I

DISCOVERING OURSELVES THROUGH PSYCHOLOGY

H. A. Overstreet

DISCOVERING OURSELVES THROUGH PSYCHOLOGY

by
H. A. Overstreet

It is a particular pleasure to introduce this course of lectures. You have not only men of distinction to look forward to but topics of profound significance. I wish that it were my good fortune to be in your place and listen to what is going to be said in the next few weeks.

My topic today, in a sense, will cover all the topics. I am going to try to indicate to you what it means to approach ourselves with a scientific psychological interest. Of course, we all approach ourselves with a kind of common sense psychology. We know when we feel depressed, or worried, or not quite up to things. In a sense, we are all amateur psychologists. Very often we practice as amateur psychologists upon our friends and do damage to them.

In the same way we are amateur physicians. But we realize that when we want to know something of importance about a physical disease, we have to get expert medical information. And so likewise when there is a grave maladjustment in our psychological setup we have to get expert psychological information.

Just as medicine has developed many kinds of techniques, so psychology, the youngest of the sciences, has been developing a number of techniques for the purpose of knowing more accurately about ourselves.

Let me illustrate what I mean by medical and psychological techniques. You go to a doctor: he will ask you some questions, he will take your pulse, look at your tongue, and put the stethoscope to your chest.

He uses clues. In the same way psychologists have learned to use clues. If you want to know about yourself, you have to know what the significant clues are that you have to interpret. Psychological tests are convenient instruments for discovering significant clues.

Let me illustrate what I mean. I am going to use a brief psychological test. Although it is exceedingly brief, it discovers traits that are important clues to personality.

There are some 25 questions.* I am going to ask these questions and you will please answer them by 0, 1, 2, 3 or 4. Zero means "no". The first question is, do you get stage fright? If you never get stage fright, answer that with a zero. If you sometimes get stage fright, answer it with a "1". If you sometimes -- about as often as not -- get stage fright, answer with a "2". If you usually get stage fright, answer it with a "3" and if you practically always get stage fright, answer with a "4".

* From Personality Schedule, by L. L. and T. G. Thurstone, published and copyrighted by The University of Chicago Press. Quoted by special permission of the publishers.

Here then are the questions I am going to ask:

1. "Do you get stage fright?"
2. "Do you worry over humiliating experiences?"
3. "Are you afraid of falling when you are on a high place?"
4. "Are your feelings easily hurt?"
5. "Do you keep in the background on social occasions?"
6. "Are you happy and sad by turns without knowing why?"
7. "Are you shy?"
8. "Do you daydream frequently?"
9. "Do you get discouraged easily?"
10. "Do you say things on the spur of the moment and then regret them?"
11. "Do you like to be alone?"
12. "Do you cry easily?"
13. "Does it bother you to have people watch you work even when you do it well?"
14. "Does criticism hurt you badly?"
15. "Do you cross the street to avoid meeting someone?"
16. "At a reception or tea, do you avoid meeting the important person?"
17. "Do you often feel just miserable?"
18. "Do you hesitate to volunteer in a class recitation or any form of discussion group?"
19. "Are you often lonely?"
20. "Are you self-conscious before superiors?"
21. "Do you lack self-confidence?"
22. "Are you self-conscious about your appearance?"

23. "If you see an accident, does something keep you from giving help?"
24. "Do you feel inferior?"
25. "Is it hard for you to make up your mind until the time for action is past?"

The foregoing are questions that look very trivial but that give us significant clues about the psychological make-up of persons. Will you now add up your score?

This scoring places you in a number of groups. "A" group represents scores from zero to 14, inclusive.

B scores from 15 to 24;

C scores from 25 to 39;

D scores from 40 to 54;

E scores from 55 to 100.

Let us now see what this means.

The author of this test, which is the Thurstone Personality Schedule, says: "Particular practical interest centers on the 'A' and 'E' individuals. And it is with their detection in mind that the scale can be best used. The 'A' individual, that is, one with a low score, may be thought of as particularly fitted for work of an irritating or exasperating nature."

Now, let us look at the "E" group. "The 'E' individual on the other hand is likely to be one fitted for creative work, difficult problems or for appreciation or therapeutics of personality difficulties."

So here we have very swiftly given the picture of two contrasted types of personality, the stable, unsensitive type and the unstable, highly sensitive type.

You are later in this series going to have Dr. May go carefully into the matter of personality measurement; so I mustn't intrude upon his domain. But we may recount some of the outstanding traits we try to discover. We find that there are people who are of the dominant type and others who are submissive. By asking certain salient questions, we can discover whether a person is a dominant or a submissive. Submissive doesn't mean what it usually means in everyday language. Some of the finest people are submissives. Some of the nuisances of the world are aggressive, dominant persons. I have a test here that seeks to discover these two types, but there is no time to give it. However you can see the importance of such a test. It would be important if you are choosing your occupation to know whether you belong in the one group or the other. For example, if you are going to be on a conciliation board, it would be a sad tragedy if you were a dominant personality. You would be far better

as a submissive personality because he is the person who draws other people out. The dominant is one who puts himself forward, who frequently "knows it all."

There is another thing we would like to know about people. We would like to know whether they are extroverts or introverts. In a position that requires a person to move about easily among his fellows, it is important to have an extroverted person. An extreme introvert would be in agonies most of the time and would probably make a failure of the work. On the other hand, if we want a person to do some research work that requires isolation from other people, great concentration and the power to work over ideas and generate original ideas, we would go wrong if we chose a pronounced extrovert.

Another thing we like to know about people is how mature they are emotionally. I wish I could go through one of the emotional maturity scales with you today but again time doesn't permit, yet it is a very interesting thing just to think about it. There are undoubtedly individuals in this room who are not yet emotionally grown up. I hope this isn't too flagrant an insult! We don't all come to emotional maturity. A great many persons in the 40's and beyond are still adolescent in their emotional life. Sometimes you can find a man of 45 who is even worse than adolescent, he is infantile. It is important for us, if we are having to do with persons -- if we want to marry a person, for example -- to know whether he is emotionally mature. If we marry an emotional infant, heaven help the marriage!

How do we find out whether a person is an emotionally infantile, or adolescent adult or mature? Here is a test, for example, in the emotional scale. "The subject is ordinarily friendly toward members of his immediate social group but in critical periods becomes irritable or hostile." That attitude is not quite mature. "This subject is extremely solicitous of his immediate family associates." That sounds fairly good, doesn't it, but it is not a wholly mature attitude. "The subject chooses his course of action with reference to his own maximum immediate satisfaction." Obviously that is not mature. "The subject believes in democracy in principle but prefers not to associate too closely with individuals from groups widely divergent from his own." That is not mature.

This particular test has 60 questions and by the time you have answered them you find out where you belong in the scale. By subjecting people to a battery of tests of the kinds I have been indicating, we can learn a great deal about these people. I suppose in the coming generation we shall make it a point to know more about human beings than we now know. Even now, of course, we take children and subject them to one important test: we try to find out where the child belongs in the scale of intellectual powers.

At your age it is not so easy to find out what the mental power

is because the I. Q. rating stops in the middle teens. There are, however, rating scales that can be applied to adults that enable them to discover whether their "intelligence" is high or average or low.

This matter of intelligence testing is one of the fascinating studies in psychology. It was undertaken by a Frenchman, Monsieur Binet, a good many years ago. It was done by taking hundreds of thousands of children and finding out what children at a certain age normally can do. You have, for example, thousands of four-year olds, and you find out that four-year olds, on the average, can do certain things. Now, you discover that here is a youngster of four years of age who cannot do what other four-year olds can do. This means that his intelligence is below the normal for his age. Here is another youngster who at four years of age can already do what six-year olds can do. He is two years ahead of his time. So he has an above-average intelligence. That is the way intelligence testing was worked out. The intelligence quotient indicates where one belongs relatively to other people.

This is an important thing to discover about a person, for it indicates what logical power he has. You can easily see that the scale of intelligence is the first thing that we want to discover in a person. But also we want to discover whether he is essentially social, likes people, gets along with people, or is a non-social person. We want to discover whether he is highly sensitized or not highly sensitized. We want to discover whether he is emotionally of the age that he ought to be. But in addition we want to find out what some of his aptitudes are. In this room we should undoubtedly discover that some of you have no pronounced sense of rhythm. We wouldn't want you to go into music. We might discover that some of you have no mechanical aptitudes. We wouldn't want you to be mechanics. We might discover that some of you have a keen auditory memory. You might well be telephone operators. We might discover that some of you have very keen visual power. You might well go into some form of artistic endeavor.

It is possible for us to discover aptitudes within fairly broad ranges. But we must be careful about aptitude tests. To discover that you have a wide auditory range and, therefore, have the power to be a good telephone operator, doesn't mean that you will be a good telephone operator. To find that you have pronounced visual powers and, therefore, have the raw material of artistic accomplishment doesn't mean that you will be a good artist. All we can do is to discover whether you have the aptitudes necessary for one or another kind of occupation.

There is one more of these clues to ourselves that I wish to speak about. In Vineland, N. J., an interesting investigation has been undertaken to discover what should be expected of us at various age levels. Those of you who are parents will be interested in this. What ought you to expect of a five-year old boy or girl? What ought you to expect of your seven-year old? What ought you to expect of your fifteen-year old?

After a number of years of investigating many youngsters at different age levels, a scale which is called a "social maturity scale" has been drawn up. At three to four years of age, a soundly conditioned youngster ought to be able to walk down stairs one step per tread. He ought to be able to play cooperatively at the kindergarten level, to button coat or dress, to help at little household tasks, to perform for others, to recite a piece, to wash hands unaided.

From two to three, most of those things are not yet possible. When you come to the five or six year level, he uses skates, wagon, prints simple words, sets table, plays games, is trusted with money, goes to school unattended. This development has taken place in two years.

Let us pass to the adult years. From twenty to twenty five the individual is supposed to be able to do the following four things: uses money providently; assumes responsibilities beyond his own needs; contributes to social welfare; and provides for the future. That is the normal 20-25. This scale however gives also the "plus" personality and just for the sake of making you feel considerably inferior, I am going to read what a "plus" personality is able to do. A "plus" personality performs skilled work, engages in beneficial recreation, systemizes his own work, inspires confidence, promotes civic progress, supervises occupational pursuits of others, purchases for others, directs or manages affairs of others, performs expert or professional work, shares community responsibility, creates his own opportunities, and advances the general welfare.

Well, this will give you, I think, something of an indication of the way psychologists go at the job of finding out about ourselves.

For the few minutes remaining, let me say a word or so about how we ourselves can adopt something of the scientific attitude toward ourselves. One of the first things I think anybody ought to do who is interested in getting a line on himself psychologically is to write a psychological history of himself. Here you are this evening. You have opinions -- religious, political, economic, social. You have emotional responses to situations. You have certain habits. How did you get to be the way you are right now?

This is different from writing a diary. A diary sets down events as they occur. This is a process of going back of the events in the present to their sources in the past.

I was speaking in Detroit the other day. A librarian said to me, "I am having a great time with myself right now. I was born into an anti-union family. I have been anti-union all my life. I am trying hard to see if I can possibly understand the union's point of view." Here was a person who was trying to get at the roots of his opinions. As he thought himself back into his past, he saw that his opinions were not opinions that he had independently arrived at but were opinions that

somehow had come to him out of his environment.

Take all your significant views and write the history of them. You will find that this will throw a great light upon yourself. It will loosen up your mental and emotional life. It will make you a great deal more tolerant about people who are different from you, and will make you very much wiser about the ways in which people come to be what they are. If you do that, you will be at the beginning of making a psychologist out of yourself.

As a matter of fact, we don't become psychologists by reading books on psychology. That is why our college psychology courses are frequently of so slight avail. The best way to become a psychologist is to be interested in people. Recall what we have been talking about this afternoon. Have you any friends that belong in the "A" class, who belong in the "E" class? Do you like them? Are they misfits? How would you place them in life if you could?

It would be interesting to take that one brief test that I gave you this afternoon and try to estimate people in terms of their neurotic sensitiveness. Then if you come to know anything about extroversion and introversion, go around and see whether you can detect the signs of obvious extroversion or introversion in persons, see what comes of people who have these different qualities. An interesting thing to do is to see whether you can detect the emotional level of people's life. How emotionally mature is this funny old gentleman, this boy friend? There is something you haven't liked about him, something that has made you feel insecure in his presence. What is it?

This brings us to another thing that I think you could do with a great deal of interest. You can examine yourself. First of all, examine yourself analytically by noting what your various kinds of habits are. Most of us think of human beings vaguely as just human beings. A much more searching way is to analyze people as to their habit systems. In the first place, they have bodily habits. Maybe they have a way of cracking their knuckles or shuffling their feet.

The body is that which is most obvious to other people and one's first approach to others, therefore, is through your body. People have voice habits. I was on the train a little while ago and had to move twice because there were two people in that car who had voices that were unendurable. They talked far louder than was necessary and had voices far less lovely than they ought to have been.

People have walking habits; clothing habits. There are slovenly people and finely groomed people. There are people that are over-particular about their clothes. There are people that have so many clothes that you know that all they think about is clothes.

People have emotional habits. There are whiners, complainers, selfpitiars. Are you a person who is none of these? Are you an

irritable person? When you take a telephone call, do you bark your answer?

You can examine your emotional life and find out just what your emotional habits are. Then we have ego habits. For example, are you constantly self-centered? When you are with other people, are you likely first of all and last of all to talk about yourself, what you have done and where you have been? Are you the kind of a person who is altro-centered? Are you almost instinctively interested in getting the other fellow to talk, not because you are trying to win friends and influence people -- that would be ego-centered -- but because you are genuinely, honestly interested in him?

When we learn much about ourselves we realize that there are two great ways of life. One way leads to psychological illness, the other to psychological soundness and health. The one way moves toward the individual himself, while the other is a movement away from the individual. When you find that a person is constantly thinking of himself, worrying about himself, centering his thoughts upon his own concerns, you have the kind of person that may, under certain circumstances, land in the psychiatrist's office. All neurotics move the ego-centered way.

The healthy movement of life is the movement away from self. That is why work is healthy. A person with a beloved work gets absorbed in it and is pulled away from himself. Work is not a curse. When it is beloved work, it is one of the grandest blessings in life because it enables us to move away from ourselves. Friendship is a wholesome relationship because you move out to your friend. For the same reason, love is one of the most invigorating of all human experiences.

We have been talking about bodily habits, voice habits, clothing habits, emotional habits, ego habits. There are also work habits. Is it your habit to put things through? Or is it your habit to begin things and then drop them? Are you dependable in your work? Are you orderly or disorderly? These work habits are a part of ourselves and play their part in the total makeup of ourselves.

Then there are play habits. There are persons whose play habit is an eagerness to win and others whose habit is a fine sportsmanship, of not caring much about whether he wins or doesn't win but of caring for the game. There is the loser who sulks. There is the player who is generous in conceding points.

Again, there are our mental habits. Are you impulsive or deliberate? Do you think all around a question, or do you tend to take obvious symptoms and give your answers in terms of them? Do you tend to react from prejudice, or do you try to get as reasonable an account of the situation as you can?

Are you neophobic or neophilic? Are you the kind of person that rather welcomes new things and new ideas, or the kind that naturally and instinctively fears new things and new ideas? Do you inwardly withdraw when an original suggestion is made, or do you rather hope that there will be original suggestions?

Thus, there are three things I have been talking about this afternoon. First, scientific psychological testing. Most of us cannot do this or have it done to us.

Second, the writing of a psychological history of ourselves. This is within the power of all of us to do.

Third, -- and this, also, is within our power -- studying our habit-structure.

There are three great problems that we human beings are deeply concerned about. The Latin poet sensed only two of these problems when he spoke of a sound mind in a sound body. We do have to be concerned about a sound body. The art of medicine, all the physical sciences, physiology, biology, chemistry and the rest have devoted themselves to producing sound bodies. We are also concerned about sound minds. The science of psychology attempts to know our minds sufficiently to enable us to make them into sound minds. Today we are adding another concern. We are saying that what we must have in our world is a sound mind in a sound body in a sound society. Some of the significant work now being done by psychologists is in the field of social psychology where we come to see that there are social influences which are so unsound as to make otherwise sound bodies and sound minds unsound.

And so we, as intelligent human beings, have the three problems of discovering how we can produce sound minds, in sound bodies, in a sound society. May this series of lectures aid in the achievement of this three-fold object.

Lecture II

CHILD DEVELOPMENT AND INDIVIDUALITY

Arnold Gesell, M.D.

CHILD DEVELOPMENT AND INDIVIDUALITY*

by

Arnold Gesell, M.D.

It does not seem inappropriate to be talking under the auspices of the Department of Agriculture because this Department has been so definitely concerned with problems of growth. Our clinic at Yale has also been interested in problems of growth, as you will gather from the title of my talk. We can learn a great deal about the human plant from growth studies such as those made by the Department of Agriculture.

Introductory

Because of the nature of this course of lectures, I was rather tempted to entitle my discussion, "Discovering Ourselves Through the Child", but on second thought my desire really was more in the direction of, "Forgetting Ourselves Through the Child". There certainly is a little danger of oversubjectivity in this task of rediscovering ourselves.

We cannot understand the child adequately unless we succeed in a measure in getting out of ourselves so that we may look upon him with freshness of vision. However, the task is two-sided and in the end it becomes even a little bit difficult to establish a scientific distinction between the child and the adult, because adults are children of larger growth.

Walt Disney, I understand, is confronted with the same problem. He is somewhat inarticulate in his philosophy but he has nevertheless expressed himself in ways which appeal universally to young and old. Walt Disney says he tries to appeal to children at the age when they want to think they are grownups, and to grownups when they want to feel that they are children again.

But this doesn't explain all of Walt Disney. To understand him we may have to go back to a certain event which took place in his childhood, thirty years ago on a Missouri farm. One sleepy afternoon an owl was drowsing on this farm. Seven year old Walt crept up on the owl and boy-like he encircled the owl's neck with his fingers. The owl instinctively fluttered his huge wings; instinctively little Walt was possessed of fear. He seized the owl, hurled it to the ground, stamped on it instinctively, -- and perhaps unwittingly killed it!

* In presenting this paper we took advantage of the excellent projection facilities which the Department of Agriculture made available to us. In order to preserve directness of diction we have adhered closely to the original stenographic record of the comments which accompanied the stereopticon slides and motion picture films.

That experience has lingered with Walt Disney and, in a way, that owl has continued to flap its wings in the nether regions of his subconscious. It is almost tempting to attribute some of Disney's genius in fantasy to this dramatic experience of childhood because this experience certainly helped to direct his special attention to birds and beasts and mice and men (owls being rather fond of mice!). There may be a deep and dark connection here, to which some psychologists might give great weight. I would not, however, be inclined to explain Walt Disney himself on the basis of this boyhood event. Rather, I would assume that he had a sensitively attuned individuality which made him incorporate and transform this experience in a significant way, -- an individuality which I believe had certain fundamental and primary characteristics even in his infancy, long before the drowsing owl. It is this problem of individuality, this important problem of human individuality which we shall try to approach this afternoon.

In a sense, it has been the central problem of our research at Yale; for we have been interested in the mechanisms of mental development which underly the formation of individuality. The psychology of growth is a rather elusive phrase because growth is something so subtle that it has never been seen by the eye of man, and who has really seen the psychic essence of the individual? Not even the poet has been able to confront us with the true nature of the mind of the infant. But in spite of the elusiveness of the problem, I shall, with your cooperation, try to make the subject somewhat less mystical, somewhat less mysterious.

If we can for a moment forget our metaphysical distinctions between mind and body, we shall think of the psyche, or the mind itself as being a living structure which grows, an organism of some kind which has design, pattern, form, configuration. We have used the cinema systematically at Yale because we believe that the outward patterned manifestations of this inward organism that we call the mind are so lawful, so sequential, and so real that they can be photographed. I shall presently show you on the fine screen in this auditorium some of these outward evidences of form in the growing mind. Pictures, both still and motion, will help us to tell the story.

Although it is impossible to reproduce these pictures on the printed page, we shall reproduce the original comments because the reader can follow the story more concretely in this way.*

* Readers who may wish to identify some of the illustrative material may consult the following references:

1. Gesell, Arnold, et al. An Atlas of Infant Behavior: A systematic delineation of the forms and early growth of human behavior patterns, illustrated by 3,200 action photographs, in two volumes. New Haven: Yale University Press, 1934, Pp. 922.
2. Gesell, Arnold and Thompson, Helen, assisted by Catherine S. Amatruda, Infant Behavior: Its Genesis and Growth, New York; McGraw Hill, 1934, Pp. 333.

The illustrative materials included the following:

1. Slides

Slide 1: Normal infant, age 42 weeks, approaches pellet.

Slide 2: Twins, age 38 weeks, in pellet situation.

Slide 3: Twins, age 38 weeks. Horizontal and zenith views of approach to pellet.

Slide 4: Twins, age 28 weeks, prehensory behavior.

Slide 5: Normal infant, age 48 weeks, poking at bell.

Slide 6: Clinical crib used for examinations.

Slide 7: Photographic dome

Slide 8: Brain cortex of fetus; and five months old fetus.

2. Sound Film: The Growth of Infant Behavior, Later Stages.

3. Slides and cinema illustrating the evidences of individuality in the first five years of life.

The Early Patterning of Behavior

The mind is not amorphous; it is not some shapeless essence or force that comes from the outside and works upon the body. The mind itself has pattern and here is an example of pattern. (Slide 1) Here is an infant who is addressing himself toward a tiny pellet on the table top; his whole physique is mobilized, -- eyes, trunk, shoulders, arms, fingers, and there is a characteristic response, characteristic of that age to the tiny pellet. We call this reaction a pattern of behavior, and why shouldn't we? It is a formed response, a response that has characteristic shape. It has shape just as a bone has shape, just as a nose in its profile displays shape.

The shape is so lawfully determined by the hidden chemistry of the body and the chemistry of growth that when we deal with twins, highly identical twins, we have highly identical patterns of behavior (Slide 2) at the same instant. These identical twins manifest a virtually identical pattern of behavior in relation to the two pellets all because their inner organization demands that they express their capacities and their individuality in this selfsame manner.

(Slide 3) And here is a twin picture of twins, -- a simultaneous horizon view and zenith view. You see how alike these twins are in their behavior. To be sure, the hair whorl of the left twin is clockwise and the hair whorl of the right twin is counter-clockwise. The mother's comb can't straighten out that difference because it was in the germ. It is a physical pattern which was determined by the germ; it is an indicator of that same lawful determination which is shaping the behaviors of the two children.

* (Continued from page 12)

3. Gesell, Arnold and Thompson, Helen, assisted by Catherine S. Amatruda, The Psychology of Early Growth, New York: Macmillan, 1938, Pp. ix + 290.

4. Gesell, Arnold and Ames, Louise B., Early evidences of individuality in the human infant, Scientific Monthly, Sept., 1937, XLV, 217-225.

(Slide 4) So, when we put these twins on the platform of our crib they bent over simultaneously, -- we didn't make them bend! -- and simultaneously they scratched on the blotter just as though they were wound up to do it. Yet two days later they didn't do it. Why not? Because an increment of mental growth that had taken place in the interval; they were on a different level of performance; their growing nervous systems were on a new plane of organization.

(Slide 5) Here is a more elaborate picture. Here is a pattern of behavior dissected. We see what a 48 weeks old child does with a little hand bell. At 48 weeks he does a great deal. I won't take the time to tell you all that happens, but incidentally note how the index finger pokes into the bell, -- a very characteristic response. Twenty weeks ago he couldn't have used the index finger to poke; twenty weeks ago the nervous system was different, the behavior pattern therefore was different. These reactions are not happening at random. They are happening in a lawful manner.

(Slide 6) This is the crib that we use for orderly observation of the behavior patterns. We put the child in a little chair, a kind of Morris chair, and give him blocks or other stimulus objects. That is all we have to do. We get reactions which indicate normal maturity from normal children. From subnormal children we get different patterns of behavior, we get retarded patterns. We are using our normative knowledge of the patterns of behavior maturity as criteria for the diagnosis of retardation and for marked deviations in the individuality of the child.

(Slide 7) This is the photographic dome by means of which we secure systematic cinema records of the infant at lunar month intervals. The mother brings the child into this pleasantly illuminated dome. We place the child in the examining chair. The mother steps outside and takes a position behind the one-way-vision screen which encases the whole dome. From this position she can see the child but the child can't see her because the screen has only one-way transparency. The infant enjoys the warm bright surroundings, and now begins displaying his abilities in response to the test situations. He may even outdo himself and surprise even the mother. We observe our children under controlled conditions but we do not use unnatural methods of stimulation. We wish to study their natural behavior characteristics.

A Sound Film Delineating the Growth of Infant Behavior

It is now time to show you some of these behavior characteristics in action. I shall do so by means of a talking film.* The pictorial

* Gesell, A. The growth of infant behavior: later stages. New York, 1934. 1 reel, 1000 feet., 35 mm. and 16 mm. One of the Yale Films of Child Development which are by a special arrangement with the University published and distributed by Erpi Classroom Films Inc.

contents of the film are indicated in italics: the accompanying spoken commentary for each item immediately follows:

A. Animated diagram of five stages in the foetal development of the human hand.

The human hand shows interesting changes in the course of its development. By means of animated diagrams, we shall briefly delineate the transformations which occur during the prenatal period. The anterior limb bud first appears. Then five knob-like structures resembling the human fingers take form. This development proceeds rapidly and during the first twelve weeks the beginnings of the forearm and finger nails become evident. The configurations then rapidly change and long before birth the hand becomes well defined and even active.

B. Calendar shows age of 8 weeks.

Growth continues; but eight weeks after birth the hand still retains some of its prenatal characteristics. The infant cannot yet lay hold of the physical world. His hand is almost a useless organ. It remains, for the most part, fisted night and day. Consequently, the movements of the fingers are limited and non-adaptive.

C. Calendar shows age of 24 weeks.

But at twenty-four weeks the fingers are open. The fist has unfolded. The fingers play in a lively manner and curl over every object they touch. Slender objects like a spoon easily become entangled between the fingers.

But the patterns of prehension and manipulation have elaborated. Note his reaction to the cube. He grasps it when it is within reach. He is well beyond the stage of mere corralling.

D. Infant 24 weeks old reacts to two cube situation.

Now observe the patterns of behavior in the two cube situation at twenty-four weeks. The examiner has placed one cube in the infant's left hand and has presented a second cube. The infant holds the first cube but gives only momentary regard to the second. To the first cube he gives prolonged regard. He transfers, chews, bangs the cube. He confines his attention definitely to one cube.

E. Multiple cube situation.

In the multiple cube situation, these patterns of behavior persist. He grasps one cube and gives only fleeting heed to the several cubes before him. He remains preoccupied with the cube in hand.

F. Infant 28 weeks old reacts to two cube situation.

In four weeks more his behavior patterns are significantly transformed. At twenty-eight weeks, in addition to holding the first cube he grasps the second one as soon as he sees it, and he holds both. He even brings the two cubes together sketchily. He inspects one, then the other, then both together. His attention, as well as his grasp, takes in two cubes.

G. Coincident projection of the same infant in two cube situation at 24 weeks and 28 weeks.

By coincident or double projection the two age levels are brought into comparative view. The pictures have been slowed to half speed so you can divide your attention equally between them. You may make your own comparison and your own deductions. The difference in complexity of these two sets of behavior patterns represents one month of mental growth. It is evident that time visibly transforms the patterns of prehension and manipulation.

Here you observe six phases of the cube behavior pattern at twenty-four weeks. Reading left to right you see: (1) Grasp, (2) transfer, (3) inspection of the first cube, (4) inspection of the second cube, (5) banging, (6) mouthing.

H. Slow motion pattern phase of cube behavior at 28 weeks.

Turning now to twenty-eight weeks we see these pattern phases: (1) regard for the second cube, (2) prompt approach, (3) grasp, (4) inspection of first cube, (5) inspection of second cube, (6) rubbing of two cubes. These reactions occur in less than thirty seconds.

I. Simultaneous portrayal of grasp at 28 weeks and at 40 weeks.

The patterns of prehension change visibly every month. This comparative view depicts the infant's manual patterns at twenty-eight and at forty weeks. At forty weeks he sits independently. He no longer needs the examining chair. He brings two cubes into constructive relationship.

J. Calendar shows age of 40 weeks.

Let us examine more closely his patterns of behavior at forty weeks. He manages even to hold three cubes at once. At forty weeks the fingers are more prominent than the palm in prehension. The thumb is definitely coming into opposition. The index finger now takes a leading part in manipulation. Take special notice of the index finger. He at once pokes the tip of the handle of the bell with his extended finger. He rotates the bell, rings it, presses it forward, holds it at different angles. He is under the irrepressible impulse to pry and to poke with his index finger. This is a significant, well defined pattern of behavior. A very deep seated pattern which asserts itself again when a tiny pellet is presented. Once more the index finger comes out. He plucks the pellet, pursues it with the poking index finger and when pellet and bottle are presented, again the poking index finger comes into prominent play.

Now for a rapid survey of the progressive growth changes which transform the patterns of cube behavior from twelve weeks to forty weeks. At twelve weeks simple regard for a cube. At sixteen weeks incipient approach, at twenty weeks, and twenty-eight weeks direct approach and grasp; at forty weeks, exploitive combining of the two cubes. These growth changes continue with each passing month.

K. Curled hand.

Recall the curled and ineffective hand of early infancy. Compare the manual dexterity of three years, and the constructiveness of five years. Throughout childhood time transforms the patterns of manipulation.

This film, I hope, has given you a more vivid sense of the early patterning of human behavior. You saw how that index finger protruded in a penetrating way. This was due to the development of certain connections in the nervous system which put the infant under an irrepressible impulse to pry and to poke. This was curiosity at a digital level, or a sensory motor level. At later ages curiosity is on a higher plane; it gets into symbolic spheres, but I am persuaded that the later growth of the mind and the growth of more subtle aspects of individuality follows laws comparable to those which account for the growth of prehension and manipulation.

(Slide 8) Let me give you a glimpse of the growing nervous system, the physical basis of behavior. Here is a cross-section of the brain cortex of a prenatal infant. Four months before the child is born he has already come into possession of the 12 billions of nerve cells that make up the nervous system. No matter how long he lives, he will not get more nerve cells. He has his full quota and during the period of psychological growth, these nerve cells are coming into multitudinous connections and as they come into connection, they mold the behavior. Even this pre-infant at the right, the five months old fetus, is already distinctly human, has human patterns of behavior. Although at that time the future infant measures but a foot in length and a pound in weight, he is already far advanced in his organization; both his bodily makeup and his behavior makeup have distinctly human lineaments. Do not picture him as grotesque, cramped and compressed. He is already maintaining an independent existence in the fluid medium of the womb. His posture even now is not unlike that which he will later assume when he lies ensconced in his bassinet. His heart is beating, his skin is sensitive, he can make adaptive movements of arms and legs and respond in an ordinary way to many stimuli. He even makes rhythmic movements of the chest, -- pre-respiratory movements preparatory to that not far off event when the air will rush into his lungs and he will be a new-born, full-born child.

If we look for the beginnings of mental growth, if we are interested in the beginnings of individuality, we shall at least give a passing glance to this pre-natal period when certain fundamentals of the psychic organism are taking shape.

Early Evidences of Individuality

We have now come closer to our subject of individuality. Individuality is governed by the same physiology of development of which we have already had tokens. Presently we shall show you some evidences of indi-

viduality in the period of infancy and preschool childhood.

Our studies at Yale have furnished unmistakable evidences of individuality in the human infant in the first months of life. Recently, with the research assistance of Mrs. L. B. Ames, we undertook an experiment in prediction to determine whether the first year of life fore-shadows the fifth year. This experiment bears so closely on the theme of the present course of lectures that I shall summarize it briefly and illustrate the findings with slides and cinema.

The study was based upon an analysis of the cinema records of five different infants. The children were photographed under homelike conditions at lunar month intervals throughout the first year of life. These extensive cinema records embraced the major events of the infant's day, namely sleeping, waking, bath, dressing and undressing, feeding, play, and social behavior at advancing age levels. Additional cinema records and psychological observations of the same children were made at the age of five years.

A trained and unbiased observer (L.B.A.) who had never seen the infants, made a detailed analysis of the cinema records covering the first year of life. On the basis of the objective evidence of the films alone, an estimate of 15 behavior traits was made and the children were arranged in rank order for each trait.

The same children were again studied at the age of five years, and were again rated with respect to the 15 behavior traits which they had displayed in infancy. The two appraisals were made independently.

Is the strength of a behavior trait in the first year of life predictive of a similar strength in the fifth year? The 15 traits of behavior individuality which were considered follow: 1. energy output; 2. motor demeanor; 3. self dependence; 4. social responsiveness; 5. family attachment; 6. communicativeness; 7. adaptivity; 8. exploitation of environment; 9. "humor" sense; 10. emotional maladjustment; 11. emotional expressiveness; 12. reaction to success; 13. reaction to restriction; 14. readiness of smiling; 15. readiness of crying.

For each child and for each trait at one year and again at five years a comparative judgment was made. Out of the 75 comparative judgments, 48 rank assignments coincided; 21 showed a displacement of 1 rank order only; 5 a displacement of 2; and 1 a displacement of 3 orders.

Our periodic cinema records clearly show prophetic characteristics in the behavior traits displayed in the first year of life. We compared five personalities in the making. None of these personalities is finished; but each is already distinctive. One child is agile, another almost awkward; one is socially outgoing, another restrained; one is very perceptive of the feelings of others; one restlessly inquisitive,

one self-contained; one is gay, another sober; one quick, another slow; one is given to lasting moods, another passes blithely from mood to mood. We have demonstrated (to our own satisfaction at least) a significant degree of internal consistency in the behavior features of these children at one year and at five years of age. This consistency seems to rest upon a biological characteristicness which lies at the core of human individuality. Because of this characteristicness, the first year of life does indeed foreshadow the fifth year of life.

Psychological Growth as a Key Concept

Growth is a simple word but it contains profound implications. It is the key concept for a sound philosophy of child care. Growth is not, of course, absolutely foreordained. Even a seed of corn needs soil and air into which to thrust its roots and leaves. The human plant needs a rich network of personal relationships on which to project its tendrils. The emotional reactions of the infant are patterned in a medium of social relationships. In every household, in every nursery, there is a web of life, an interdependence of persons which becomes registered in the growing personality. If the infant is cared for consistently and sympathetically, he acquires a sense of security. He learns to feel safe, confident, and expectant in a world of vicissitudes. He belongs. He has faith that he will be fed, sheltered, assuaged, and loved. This faith, this sense of security, issues in a slowly increasing self reliance. The sense of security is not a mysterious intuition, but an organized disposition built up steadily by daily experience.

The makeup of personality is therefore importantly influenced by family life, by parent-child relationships and teacher-child relations, by social surroundings.

But we must not jump to the confusing conclusion that we can mould the child as though he were so much clay. Assuredly he is not clay. Clay does not grow. Nor is he a bundle of conditioned reflexes. He is an individual, with inborn propensities, with inherent constitutional characteristicness. As such he is subject to the same laws of growth which shape the progressions of cube behavior.

We may indeed assist the child in his growth but he must do his own growing. The first and almost the last task of the adult is to understand the child, -- that is to comprehend the limitations and the configurations of his individuality. Infants are individuals.

We pay vastly too much attention to mere training and instruction. Our central task particularly in the first five years of life is to discover and to respect individuality even in the tender age of infancy. If we focus upon this difficult but fascinating problem of understanding individualities, a new atmosphere will seep into home and school. There will be more tolerance, more kindness, and much more humor. More humor because we cannot get a true estimate of ourselves or of others without that sense of proportion which is the sense of humor. More kindness,

because if we appreciate the formativeness of the child's personality, sarcasm and other unnatural forms of punishment become impossible. More tolerance, because we would see the "faults" of children as symptoms of immaturity.

For all these reasons growth is the key concept for a sound philosophy of education, -- the education of young children and possibly also of ourselves.

Lecture III

MAIN TRENDS OF PSYCHOLOGY TODAY

Charles H. Judd

MAIN TRENDS OF PSYCHOLOGY TODAY

by
Charles H. Judd

There are two names to which I shall have occasion to refer frequently this afternoon. They are the names of the two men who more than any others have determined the trends of psychology in this country and abroad. One name is that of the great German leader in psychology, Wilhelm Wundt. Wundt established the first laboratory of experimental psychology, was the author of the first great work on physiological psychology and late in his career published a series of volumes on social psychology. Wundt trained in his laboratory of experimental psychology at Leipzig a number of the leading psychologists in American universities and colleges. The other man to whom I shall refer is William James, our own American psychologist.

These two men established what may be described in general terms "the science of psychology" as distinguished from the earlier types of psychology which dealt more with philosophical issues. Psychology has always had a very close relation to philosophy. The textbook that was used very largely in the 1870's and 1880's in the United States was Noah Porter's "Human Intellect." Noah Porter was professor of metaphysics and mental and moral philosophy at Yale. Mental and moral philosophy constituted that subdivision of the Department of Philosophy at Yale in which Porter and his immediate successor George Trumbull Ladd did their work. They represent in a certain sense the transition from philosophical psychology to the scientific psychology of Wundt and James.

It is interesting to note that both Wundt and James prepared in medicine, and not in philosophy. Both of them did, as a matter of fact, late in their careers become interested in certain broad philosophical issues, but their training was scientific. James was a student of Agassiz and gained his knowledge of the human organism primarily through studies that were biological in character. Furthermore, both men acknowledged their indebtedness to that writer and thinker who just about a century ago projected a strictly empirical science of the human mind, namely, Johann F. Herbart. Herbart pointed out the fact that, if we are to have anything like an explanation of the phenomena of human life, there must be systematic empirical investigations of the way in which minds act.

Following the lead of Herbart in Germany there came a long succession of workers who attempted to determine quantitatively the relationship between physical reality and mental reality. It is almost an accident that we do not call the science that we are discussing today psycho-physics. Indeed, Professor James McKeen Cattell, formerly of Columbia University and earlier of the University of Pennsylvania, had to make a choice in determining whether our ordinary American designation of the science which we are discussing should be "psycho-physics" or

"psychology." He chose the name "psychology."

Psycho-physics as a phase of psychology is important because it determined some of the major trends that appear in later psychological thinking. The very term indicates that the scientists who followed Herbart and who worked during the middle of the last century were trying to discover what is the relation between the psychological process, on the one hand, such as sensations of sight and sound, and the physical stimuli which produce them, on the other. The laws in the two spheres, the psychical and the physical, are different. For example, if one increases very slightly a physical stimulus, such as a pressure applied to the skin, it does not always result in a similar change in sensory experience, that is in the mental world. It is necessary to increase the physical stimulus in proportion to its total strength in order to produce the least perceptible change in the mental world.

The measurement of mental processes which has sometimes been thought of as a relatively new achievement had its origin in psychophysical studies very shortly after Herbart did his great work in the twenties and thirties of the last century. The fact that psychological measurement is thought of in some quarters as of recent origin may be due to the lack of interest in measurement by William James.

James never showed patience in making experimental and quantitative determinations. In fact, he alienated the leaders in psychology in Germany by turning his rather caustic wit against some of their activities. These quantitative determinations are very laborious, and James in one of his writings said that they could have been made only in a land where the people did not know what it is to be bored.

That remark of James so far alienated Wundt and the other leaders in German psychology that for a long period of time they were unwilling to recognize him as a leading psychologist; they thought of him rather as a humorist.

The measurement movement that began in Germany was reinforced by a stream of influence that issued from English thinking. Sir Francis Galton, known to some of you in fields other than mental measurement, was interested in applying statistics to a great many complicated phenomena. He pointed out the fact that if one wanted to find out something about the weather one can do so only by gathering statistical data for long periods of time and from many geographical areas.

Galton also studied the histories of the English men of science and discovered that all the great leaders of England came from a very small number of families. He made measurements of the peculiarities in mental life. He found that some of the members of the British associations of science had relatively less powers of visualization than ordinary people.

Galton's work has been of large influence in modern psychology because his statistical techniques have been extensively used both in psychology and biology. A number of the leading psychologists of this country have learned from Galton's followers how to use various methods of quantitative determination.

A third stream of influence that has to do with this quantitative measurement of mental phenomena came to America from France. Alfred Binet, the French psychologist, had been very much interested back in the 1890's -- his first publication is dated 1890 -- in measuring his own daughters, and he found certain unique differences between the mental characteristics of his children. He established the general notion of individual differences to such a degree that we have adopted that distinction as one of very great importance in the fields of practical psychology. In 1905 Binet issued a series of tests that he had worked out in response to a request of the educational authorities of Paris who were desirous of suiting the curricula of the schools in some fashion to individual differences of pupils. These authorities were especially desirous of finding some device that would make it possible to deal with children of lower than average mentality. The Binet tests were designed to select from the school children of Paris those who were of less ability than normal for the purpose of giving them a type of treatment that would be very special and different from that which was given to the average child.

The series of tests prepared by Binet was refined in a later period. It came to this country and has been widely utilized for the purpose of measuring general intelligence. The Binet, or the Binet-Simon, scale as it is called is a unique creation because it attempts to determine the general intelligence of a given child by comparison with the average intelligence of children of the same age. The fundamental principle on which the scale is based is that if one can discover the kinds of questions that three year olds in general can answer it will be possible to apply the same tests to any particular individual of three years of age and thus determine his mental age. Similarly a given four or five year old individual can be matched to the abilities of the average four or five year olds and so on. If an individual cannot answer all the questions that the ordinary individual of his age can answer, then he is inferior in intelligence. A quotient was worked out which is known as the "intelligence quotient." The intelligence quotient is the relationship between the age as determined by the tests (the so-called mental age) and the chronological age. If the mental age is used as the numerator of a fraction of which the chronological age is the denominator the ratio thus expressed is the intelligence quotient.

In many current systems of psychology the chief purpose is to define intelligence by the use of techniques employing tests and treating test results by elaborate statistical formulas. The most popular form which statistical psychology has taken of late is known as factor analysis. If it appears as a result of statistical measurements that certain

individuals have certain characteristics, these characteristics are regarded as factors much in the same sense as chemical elements are factors of compounds. For example, some individuals have conspicuous ability in arithmetical operations. If it is found by tests that a given individual has conspicuous ability in solving arithmetical problems arithmetical ability is regarded as a factor of his personality. Galton was interested in the power of visualization. If it is found by statistical measurements that a given individual has pronounced ability to call up vivid visual memories, it is concluded that a factor of his intelligence has been discovered.

One of the leaders in statistical measurements in psychology, Thorndike, has gone so far as to give a definition of intelligence, not in terms of the word "intelligence," but in terms of the results secured by certain tests. He speaks of intelligence as having the form, $CAVD$. Thorndike has four tests, one of which is a so-called completion test. C is the relative position of an individual on the completion test; V is the individual's score on a vocabulary test; A , on an arithmetical test; and D , on a test in following directions. In other words, instead of talking about intelligence as one does in ordinary parlance, Thorndike talks of an individual's power in four specified lines.

It is not necessary to spend more time on psychological measurements and the testing movement. The attempt has been made to indicate the importance of statistical methods. It may be well to add the statement that there are now tests in practically every field for the purpose of determining individual differences and for the purpose of determining aptitudes. Tests were used with great and successful application to practical issues during the World War.

I am tempted to pause and give one illustration of the successful use of tests during the war. When this country entered the war, the psychological association offered its services for the government. Mr. Baker is authority for the remark that the psychologists were the last people to be mobilized in the war, but that if there were another war the psychologists would be the first to be mobilized.

The psychologists succeeded in eliminating from the army a number of abnormal individuals and that in itself was a great service, but the tests went very much further and by determining aptitudes, located recruits in various types of activity within the army. The story I am going to tell you is not altogether typical but I think it will illustrate the process.

In one of the camps, there was a cavalry division. When the recruits came in they were assigned somewhat without discrimination in the early days to this, that, or the other duty in the camp. In this camp certain recruits were assigned to take care of the horses. Many of them had had no contact with horses, and the consequences of assigning them to duty as stable boys were disastrous for both the recruits and the

horses. The Commandant, learning of the situation, sent to the young camp psychologist and told him to use his tests to select stable boys. Stable boys were not referred to in any of the tests. The camp psychologist asked himself what to do. Even psychological headquarters in Washington did not know what to do in such a case. After a bad night the camp psychologist decided that the probabilities were that taking care of animals would interest a person of relatively low intelligence so he picked out five morons -- there were some available at that time -- and sent them in response to the Commandant's orders. He got the very encouraging statement next day: "Very good. Send me fifty." Somebody has said that in France they put that sort of people in charge of the trucks.

Aptitude tests are among the most successful and most widely used tests. There are aptitude tests for mechanical occupations; for stenographic positions; for admission to medical school. There are aptitude tests for a great variety of different forms of practical activity.

The movement in psychology which may properly be considered next is the movement described by the term "physiological psychology." There was a time when there was no physiological psychology. The earlier philosophers regarded mind as something quite apart from all mundane realities -- regarded the mind certainly as distinct and separate from the body. Wundt and James, as was pointed out, had trained themselves for entrance on the profession of medicine and they knew that there was a brain. Aristotle did not know very much about the brain. He thought it was an organ useful to cool the blood -- a kind of spongy substance in the body set apart for that purpose. (In some cases I believe it does serve that purpose but it has other purposes as well.) The true function of the brain was not known until physiology as a science had advanced to a high stage of development. The brain as the center of the physical conditions for mental life was not really understood until less than a century ago.

One of the great physiologists of the early nineteenth century, Mueller, wrote for his handbook on physiology a chapter on "Menschen und Thierseele," ("Human and Animal Minds"). He was interested as a physiologist in the nature of the minds of men and animals. Wundt used the title of Mueller's chapter as the title of the first book on psychology which he wrote. In that book he describes at some length the relationship between mind and body. Later he wrote a great work which has gone through five editions, the physiological psychology. The first English book of that title was by Ladd and appeared in 1887. Since the appearance of those books there has been a clear recognition of the close relationship between the biological sciences and the science of psychology. It is fully understood that the physical conditions for mental life are to be found in the brain and in the nervous system.

There is disagreement among psychologists with regard to the way

in which consciousness is related to its physical conditions. Here I come to the point that the Chairman made in the introduction when he said that modern psychology frequently exhibits conflicts of opinion.

There is a part of the nervous system that, speaking in biological terms, is very old. It is the lower part of the system. The frog has a spinal cord; it has a medulla. The frog has a very small cerebellum and a small cerebrum. The frog exhibits the ability to perform reflex acts. If it is stimulated in a certain way, a contraction of the muscles takes place promptly in response to the stimulation.

It is interesting to pause to comment on the reason why direct responses to stimuli are called reflexes. The early physiologists knew very little about the structure and functioning of nerve cells and nerve fibers. They regarded the nerve fibers as fine tubes. Descartes, for example, thought of the nerve fibers as tubes up which traveled what he called the animal spirits, little puffs of air. In reflex acts the animal spirits came back very promptly. If one wants a perfectly concrete idea of what a reflex is, let him put his hand on a hot object. There is no intelligent consideration of the situation; the hand is immediately withdrawn. Descartes explained such a happening by saying that the animal spirits must have encountered some sort of reflecting surface in the nervous system from which they rebounded. Modern science still uses the term "reflex act" for that very short circuit, beginning with the sensory impression, going through the nerve fiber and returning very promptly to the muscle to produce a contraction.

The reflex pattern is certainly the pattern of behavior in the lower parts of the nervous system. The human spinal cord is the center of many reflexes. As indicated, if one puts one's hand on a hot object, it will be withdrawn promptly without any consciousness until after the act is completed. The reflex centers attend to what may be called the housekeeping duties of the body. When a human being goes to sleep it is the upper part of his nervous system that stops functioning. The spinal cord stays awake. If some part of the body gets cool, the spinal cord receives a message from the surface and attends to the message by drawing in the member that is cold. If the stimulation continues the spinal cord will set up a sufficient agitation to call the attention of the upper parts of the nervous system to the situation. The individual is in this way awakened.

There are a number of biologists who express opinions very freely about mental processes and their conditions in the nervous system. It is always interesting to note that people very frequently express opinions in the psychological field when their knowledge about mental processes is only partial. Because one has mental processes one is disposed to think that one knows all about them. At any rate, the biologists very frequently advance the theory that the upper parts of the nervous system are nothing but very complicated series of reflexes.

If reflexes are combined in chains, they say, there appear delayed reactions but these are in essence the same in fundamental character as the reflexes.

The other theory accepted in physiological psychology is that there is a fundamental distinction between the lower part of the nervous system and the highest part of the nervous system, namely the cerebrum. The interesting fact is that the cerebrum does not appear as a large and important organ as early as does the lower part of the nervous system. The lower animals are reflex animals. Gradually the cerebrum evolves and becomes the seat of a wholly new type of behavior and experience. One can say that the lower parts of the nervous system are universal and they are fairly well organized in the lower animal forms. Not so with the cerebrum. This is characteristic of the higher animal forms. The large cerebrum is the most characteristic physical difference between human beings and all of the lower animals. The human cerebrum is twice as large as the cerebrum of the highest of the primates. It is in the cerebrum that the immediate conditions of the higher mental processes appear.

A dog has a cerebrum but it is not large or complex. The dog does not philosophize or meditate. He hasn't any organ with which to carry on these higher processes. What happens in the human cerebrum can be explained in general terms by saying that the cerebrum is not an organ for the immediate reception of stimulations. All the stimulations that come up to the cerebrum come up from below. They are referred up to this higher center for the purpose of relating them to the other stimulations that also come from the outer world through some lower neural center. After stimulations have been associated they may arouse higher forms of behavior than those exhibited in reflex acts. A typical illustration of a higher form of behavior is speech. Language is possible because human beings can associate or combine in the cerebrum the visual appearance of an object and the sound that is used by society as the name of the object. One can see the object; one can repeat the sound; but to associate the object with the sound and to use a sound as a substitute for the visual impression of the object requires a power which no animal other than man possesses.

Language is one of the characteristic results of associative activity; mathematics is another. No animal has either. In other words, the large cerebrum which is the characteristic part of the human nervous system conditions the higher mental processes, the processes that make possible consciousness and rational adjustments.

Physiological psychology has developed to the point where some of its techniques are very interesting. It has recently been possible to record some of the electric currents that are produced in different parts of the cerebrum during mental activity. In due time the new techniques ought to greatly enlarge knowledge about cerebral functions.

I shall mention, but pass over rather briefly, in view of my limited time, the fact that modern psychology is more absorbed than ever before in the study of mental pathology. There is also large popular interest in pathology and particularly in psycho-analysis. In ordinary conversation one hears frequent reference to Freud. Freud tried to explain all forms of neuroses and psychoses, all kinds of mental abnormalities, as the result of perversion of the fundamental instinctive drive which seems to be the most important drive in human life. To Freud practically all abnormalities growing out of maladjustments are the sex impulses of individuals. Following the work of Freud there have been other students that have pointed out that there are other drives which are significant. As soon as conflicts of any kind disturb the equilibrium in an individual's life, his own life and his adaptation to society may become abnormal.

Freud and his followers have also laid great stress on the subconscious. This group is to have authoritative discussions of this matter later in this course; we may, therefore, pass on without further comment on mental pathologies.

One of the great conflicts in modern psychology is the conflict between analytical psychology and that type of psychology which seeks its explanations by referring to mental wholes -- wholes as distinguished from parts. There is a school of psychology which has in recent times attracted a great deal of attention. It goes by a German name, since it originated in Germany; it is called the "Gestalt Psychology." The word "gestalt" means a configuration or form. The stature of an individual is his gestalt. The gestalt psychologists say that the only valid description of a mental process is one which emphasizes its total configuration including its relations to its background and to all that is going on in the mind in which this process occurs. As pointed out earlier factor analysis lays great stress on the elements of mental life. Gestalt psychology is utterly opposed to factor analysis. Analytical psychology, whether it accepts factor analysis completely or only partially, tends to break up mental life into its elements and to find an explanation of mental life in its elements. The gestaltists say it is impossible to explain mental life in that way. Mental life has the character that it exhibits by virtue of the fact that it has a certain organization.

Many of these experiments on which present-day conclusions about mental life are based deal with animal psychology because the learning process of animals is comparatively simple. The gestaltists perform many animal experiments. One investigator of this school trained a chicken to get its food from a light gray card. He placed before the chicken a card of light gray and one of dark gray. He put grain on both of these but frightened the chicken away every time it tried to get grain from the dark gray card. He let the chicken have grain from the light gray card. After the chicken had been trained in this fashion, it was confronted with two new cards, one, the light gray card from which it had taken grain and, another, still lighter. The relation between the

very light gray and the light gray was the same as the relation between the light gray and the dark gray. If the chicken had learned a particular gray as distinguished from the lighter of two grays it should have continued to get its food from the same card from which it was trained to get it in the first instance. The fact was that the chicken turned to the new, very light gray card. The chick had some notion of relationships, or to use the gestalt phrase, it took into consideration the totality of experience. When it was trained to get food from the light gray card, it had in the periphery of experience the dark gray card. In the new situation the light gray card became relatively the dark gray and was, therefore, neglected.

Another illustration will perhaps make a little clearer the position of the gestaltists. You see me in the presence of a certain background. The background is just as much in your consciousness as the speaker himself. Your mental process includes the whole background. If there should be a sudden change in the background you would be just as much interested in that as you are now in the particular center on which your attention is focused. So the gestaltists conclude that mental life is not made up of elements. The totality of mental life is its reality and is to be distinguished from anything that can be found through analysis.

The analytical psychologists are entirely opposed to the gestaltists and are very numerous. Analytical psychology can be said to have come into clear attention on the part of students of psychology in the early nineties. At that date a book appeared written by a German writer named Kuelpe. This writer influenced American thinking because of his relation to an eminent American psychologist, perhaps known to some of you, Edward Titchener. Titchener was an enthusiastic analytical psychologist. He sought in every case to break up mental processes. He was also an experimentalist. He tried to analyze every mental situation so as to discover what made up the general mental process which he was studying. He did not use tests as do the proponents of factor analysis. He worked in the laboratory and relied chiefly on introspection.

The analytical psychologists and the gestalt psychologists are sharply divided at the present time and the division is so sharp that it has some of the emotional tinge that frequently appears in scientific controversies. Emotionalism results in some measure from the fact that the gestalt psychology originated in Germany. The German psychologist takes himself on the whole somewhat more seriously than anybody ever takes himself on this side of the water. If you disagree with him, you have to recognize the fact that the contrast is likely to be resented.

There is another disagreement among psychologists which is even more bitter than that between analytical psychologists and gestaltists. It is the controversy growing out of emphasis on the term "behavior." I will tell you where behaviorism originated. I am quite certain that the defenders of the doctrine will not admit that my statement is correct,

but I am sure it is.

Behaviorism originated in the recognition of the fact that muscular activity and its antecedent motor neural processes are of major importance to psychology and to the explanation of mental life. If one goes back to the earlier schools of psychology, to the so-called British association psychology, for example, one finds that psychologists were interested primarily in sensations, in impressions. They thought of mental life in terms of its content. It very soon appeared when experiments were made in the psychological laboratory established by Wundt in the late seventies that mental life cannot be explained in terms of the sensory impressions that come to an individual from the outside world. A person's mental life is determined by what he does. One can give a great variety of illustrations that prove the truth of this assertion. One goes up and down a street but has no vivid consciousness of the houses that are not entered or otherwise reacted to. If an architect looks at a house he is interested in a great many phases of the building to which an ordinary citizen pays no attention at all. The architect is a builder of houses. Everyone's mental life is determined by what he does. One is constantly selecting from among one's sensations those that are related to active life. The tailor is interested in his clothes; the shoemaker is interested in shoes.

Wundt did not use these illustrations in the seventies; he used more dignified illustrations, but he said the same thing. Mental life has to be explained by what he called the innervation process. He meant by innervation the outgoing motor process. The motor neural process, he said, is just as important in determining the mental life as the incoming sensory process.

What Wundt said was repeated in a new form by William James. James' greatest contribution to modern psychology is his emphasis on action as distinguished from sensation. He is one of the authors of what is known as the James-Lange theory of the emotions. The early psychologists did not know what to do with the emotions. Emotions seemed to them to get in the way of the intellectual processes. So these early psychologists wrote a few chapters at the end of their books describing the emotions but they gave no real explanations.

James came forward with the theory that the emotions are related to action, not to impression. Two people look at exactly the same item in the newspaper; one is delighted, the other crushed. Why? Because this item fits into the active life of one individual, and in the case of the other individual obstructs all his plans and all his schemes of action. There results from this relation of impression to activity an experience which is of major importance, namely, emotion.

Lange said the same thing but he was interested in pathological cases. He pointed out the fact that there are certain individuals who reach a state of hilarity through the use of drugs. There isn't anything to be hilarious about in external circumstances. Hilarity is

explicable only by reference to internal conditions. Internal conditions are motor conditions of contraction or relaxation, not conditions of impression. One can be happy or melancholy, again primarily because of disturbed motor processes. A melancholy person will find something to be melancholy about. His melancholy is not to be imposed upon him by the impressions which he receives; it is something that he imposes on the world.

The discussion of behavior as explanatory of mental states was well under way back in the early days of physiological psychology. Darwin and other biologists were also greatly concerned about emotional behavior. Emotions gave Darwin difficulty because they did not fit into his formula of evolution which required all activity to have some value in adapting individuals to their environment. The trends of all scientific thinking were in the direction of emphasis on action. When James came forward with this theory of emotion, he marked a new epoch in psychology. He broke away from the traditional attitude that sensations are the important factors in mental life. He injected into psychology an entirely new concept, the concept that the individual himself contributes to his own mental activities, that the individual by his organization, by his very constitution, determines the way in which his mental life will flow forward.

After Wundt and James had pointed out the importance of behavior, John B. Watson coined the word "behaviorism" and went much further than either Wundt or James had gone. He said the only way one can get any reliable evidence about the mental life of an animal or human being is to study behavior. If one tries to look into one's own consciousness, if one introspects, and tries to understand what is there going on, one is sure to be deceived. One cannot analyze one's self. It is impossible to be angry and to be at the same time a student of anger.

It is difficult to see what Watson gains by repudiating introspection. It is perfectly clear that his emphasis and that of Wundt and James on behavior have contributed greatly to the practical applications that have in recent times been among the most important phases of psychological development.

One of the most important lines of application of psychology is in education. Your Chairman has already mentioned my own personal interest in educational science. Another field is social psychology, but you will hear about these and other phases of psychology in later lectures in this course. By merely mentioning them I have done my duty. My function has been to indicate some of the trends and some of the controversies in general psychology and in this way to prepare you for the special discussions which are to follow.

Lecture IV

PSYCHOLOGY IN THE EXPERIMENTAL LABORATORY

H. S. Langfeld



PSYCHOLOGY IN THE EXPERIMENTAL LABORATORY

by

H. S. Langfeld

All the world's a stage for the psychologist. He studies human nature wherever he finds it, and therefore his laboratory is a very large one. The psychologist, nowever, is not always thinking about the minds of his friends when he meets them socially; contrary to the opinion of some persons who seem to be somewhat nervous about meeting psychologists because they are afraid that he will read their minds. This attitude of the psychologist was rather neatly summed up by a late colleague when he was asked by his neighbor at a dinner party whether it was not very interesting to look around the dinner table and judge what the people were thinking about. He said: "My dear lady, a psychologist is no more interested in the minds of his companions at a dinner table than is a physicist interested in the surface tension of the soup."

Now, most large things have small beginnings. As you know, psychology was in the hands of the philosophers from the time of the Greeks until the last century. At the end of the 18th century, however, there was an occurrence at the Greenwich Observatory in England which had an influence on the development of scientific psychology. The director's observation of the time of transit of the stars was different from that of his assistant. It was rather puzzling because the assistant's time was consistently different from that of the director. Usually when there is a difference between a director and an assistant the latter is considered wrong. The assistant was dismissed. It was not until some years later that another scientist discovered that the discrepancy was due to a personal equation, namely, to an individual difference in the reaction of the two persons.

This incident caused scientists to ask whether it was not worth while to investigate scientifically the reaction times and other mental functions, but it was a long time before there was actually a psychological laboratory. This was established by Wundt in Leipsic in 1879, and among the first problems were those on reaction time, connected to a certain degree with this incident of the Greenwich Observatory.

As there seems to be for many persons some uncertainty as to what a psychological laboratory actually is I shall describe the physical layout of a modern laboratory, and shall take as my model the laboratory at Princeton because it happens to be the first laboratory which was built entirely for psychology.* There are, in the first place, about twenty

* H. S. Langfeld, Princeton Psychological Laboratory, J. Exper. Psychol. 1926, 9, 259-270.

small rooms which are used for offices and research rooms. These are rooms similar to those one would find in any scientific laboratory. They are equipped with various forms of electrical power, gas and air pressure. We started with one sound-proof room for acoustical work but will shortly have four such rooms, as research on hearing and other problems which require rooms that are both sound-proof and shielded from electrical influences are becoming increasingly important. There are also three dark rooms for experiments upon vision, where the illumination has to be very accurately controlled. These rooms are also used for photographic work. The laboratory has its own library which contains the important psychological books and about seventy scientific magazines on psychological subjects in most of the modern languages including Chinese and Japanese. There are several rooms for the storage of the delicate apparatus. In the basement is a large machine shop and carpenter shop where most of the instruments are made. A large room with skylights is used for the training course in experimental psychology and also for photographic work. When we want a large open space, we use the roof. For example, at the present time students are performing experiments at night upon the localization of sound, a problem which has a very practical value.

Now that we can visualize a laboratory, it seems in order to describe some of the experiments that have been done and some of the applications that can be made of the results. Our first concern, of course, is with the fundamental facts of psychology, but, just as in any other science, we hope that these fundamental facts will be useful in the solution of everyday problems.

For many decades the psychologist has been developing an instrument in order accurately to measure the various reactions of human and sub-human organism. Fortunately we now have an instrument which can measure times with sufficient accuracy to the thousandth of a second. In the standard reaction experiment we are not only interested in discovering the individual differences between people but also the changes in reaction time under changing but well-controlled conditions. There is in the first place what is called the simple reaction in which the reaction is carried out as quickly as possible, as soon as the subject receives the signal. The time is taken automatically between the giving of the signal and the response of the subject. There is also what is known as the choice reaction. The subject, for example, is instructed to press an electrical key with the right hand when he sees a red light, and with the left hand when he sees a green light. These conditions can be made more complicated in various ways in order to represent different practical situations. The applicability of such results in the applied field is evident. They are important in tests for aviators, automobile drivers, telephone operators, factory workers, filing clerks, and so on.

To return once more to the Greenwich Observatory incident, there is an experiment which closely resembles the situation which they obtained. The subject is instructed to tell what point on a scale a

sliding pointer has reached when the subject hears a bell. There are two forms of instruction. According to the one, the subject is told to attend to the sound of the bell, and only secondarily to the pointer. According to the second, the attention is reversed. It has been found that the stimulus to which the subject primarily attends is apprehended sooner than the secondary stimulus. This is called technically the law of priority of entry. On account of the shift of attention from bell to pointer, sometimes the bell seems to ring earlier than it should, and sometimes later.

With regard to reaction, there are many psychologists who believe that whenever we think, we make some kind of response. These responses may occur unconsciously. In the laboratory it is possible to demonstrate this form of unconscious movement. For instance, one can fasten a marker on the head of a subject in such a way that it will write on a sheet of smoked glass placed above his head. The subject is then asked to close his eyes and to think very hard of moving to the right, to the left, to imagine himself steering an automobile in different directions, etc. It will be seen from the tracing of the marker on the smoked glass that his head has involuntarily made movements in the direction of which he was thinking. Sometimes we notice our friends making such unconscious movements and know what they are thinking about. This is a perfectly natural phenomenon and has nothing to do with mental telepathy. A typical example of such unconscious movement is the slight push toward the door which the busy executive gives his visitor's hand. Animals are very sensitive to these slight movements which are made by those about them. We are sometimes astonished at the almost uncanny way in which our dog or horse seems to know what we want it to do. Some time ago there was a famous horse in Germany called "the Wise Hans" who seemed to be able to count and to perform intricate calculations.* If you asked him how many two plus two made, he would paw four times and stop, and then would get a lump of sugar. He could also multiply and divide; in fact he seemed to learn more rapidly than do children. After thorough investigation, it was found that the horse's extraordinary intelligence could be explained on the basis of these unconscious movements. The situation was as follows: the horse was surrounded by persons eager to see what he could do. When he pawed the right answer, there would be some almost imperceptible movement in the crowd which he detected. The proof of this was the fact that when all observers were put behind a screen and the horse was left entirely alone, he could not give the correct answer. It is these same movements following thought which underly the well-known phenomenon of the Ouija board.

Another early experiment was upon the nature of muscular work. Obviously in the laboratory it was necessary to start with very simple

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* D. Katz, Animals and Men. New York: Longmans, Green, 1937, pp. 2-8.

tasks which can be thoroughly controlled in order that we may know to what the results are due. For this sort of experiment we have an instrument called an ergograph which consists of a weight hung over a pulley by a string or wire. The apparatus is so arranged that the little finger can raise and lower the weight. The individual is instructed to pull the weight up and down as long as he can. The length of each pull is registered in the form of a curve on a smoked drum or some other registration apparatus. To give an example of some results, suppose the finger has to pull up a weight of six kilograms, which is about thirteen pounds. If two seconds rest is allowed between each pull, the individual can keep up a rhythm of movement for about a minute, and then his finger strength gives out and it takes about two hours for the finger to recover; but if ten seconds rest period is given between each pull, he can go on almost indefinitely. Such results are very suggestive to the industrial efficiency expert in regard to the spacing of work. In a factory where they press clothes, two girls working continuously had an output of forty-two gross in forty-six hours. They tried three girls on the job working forty minutes and resting twenty minutes. The output was thirty-nine gross in thirty hours. The three girls were less fatigued at the end of the time than were the two girls.

In the above connection it might be stated that the actual feeling of fatigue is not always a correct indication of the physiological condition. One can feel very fatigued, in fact so fatigued that one feels it would be impossible to do any more work, and yet one can continue if one has the right incentive. For example, in the ergograph experiment the individual reaches a point where he can no longer move his finger. If, however, a proper inducement is given him to continue, he finds that he can keep going some time longer. We know in actual life situations that we can do a great deal more than we think we can if we have sufficient motivation. In times of danger, for instance, individuals have been known to lift heavier weights than would have been possible under ordinary circumstances. In a laboratory experiment along these lines individuals were put to work for five and one-half hours. The time was divided into fifteen units and the individuals were asked to rate their fatigue on a scale of 1 to 7 before and after each one of the fifteen periods. The fatigue curve went up but the work was actually steady or increased toward the end. In other words we may not always be as tired as we think we are. Most of us can remember as children how tired we felt when we were asked to go upstairs to fetch something for our parents, but how quickly the feeling of fatigue disappeared when we were called out to play by our companions.

The psychologist naturally must be careful that he does not deduce too much from his laboratory experiments. Obviously there is a physiological limit or danger point in practical situations, although this point seems surprisingly far off in some instances, as in the case of the individual who was able to multiply four place numbers mentally from 11 a.m. to 11 p.m. continuously for four days. All that the experiments suggest is that the sense of fatigue is not always indicative of the

actual fatigue.

Another problem which has figured very prominently in the psychological laboratory is the problem of learning. In the early days of experimental psychology the pioneer work in learning was done by the German psychologist, Ebbinghaus. The research was in the field of memory and for the most part nonsense syllables were used in order to obviate the uncontrollable factor of meaning. The work was undertaken to determine among other things how many repetitions were necessary to learn series of words of different lengths, how much time should be given between the different trials in order to get the best results, whether large blocks of material should be gone over at one time or whether material should be learned bit by bit.

At the present time a great many experiments in learning are being conducted on the principle of the conditioned reflex. A practical situation which shows the conditioned response in learning is that of the child who dreads the fire. Obviously the child does not instinctively withdraw from the flame; in fact much to his parents' regret the young child will be very apt to put his finger in the flame to see what it is like, but after he has once burned his finger, the mere sight of the flame will cause him to inhibit his investigation. In other words the sight of the flame will now act as a substitute for the pain and will cause the hand to withdraw. Work on this form of learning was started by the famous Russian physiologist, Pavlov,* and the experiments have become famous throughout the world. Pavlov arranged a set-up so that he could measure the amount of saliva which was secreted by the salivary gland of the dog. A simple experiment was as follows: the dog was shown meat and salivation would follow. The next step was to ring a bell just before the meat was shown to the dog. This was continued a number of times until finally the sound of the bell would cause salivation without the meat. As is evident, this experiment reveals the physiological background for the old conception of the association of ideas, and that is one of the reasons why it has had wide influence in experiments on learning. There have been many experiments in the laboratory on conditioning. There is, for example, the conditioning of the knee jerk. The leg can be caused to jump by having an instrument hit it just below the knee-cap. A bell is rung at the same time or just before the instrument hits the knee. When this is done a number of times, the knee will jump at the sound of the bell without being hit. The conditioning can be more readily obtained if one thinks of something else during the experiment, otherwise one is apt consciously to inhibit the knee jerk since it can also be a voluntary movement. The eye wink, which is likewise a voluntary and involuntary response, can be similarly conditioned. This is done simply by having a jet of air squirted on the eye just after the ringing of the bell. One can even condition involuntary muscles as in the contraction of the iris of the eye. A light is flashed into the eye after a bell is

* I. P. Pavlov, Lectures on the Conditioned Reflex, New York: International Publishers, 1928.

rung and eventually the ringing of the bell will cause the iris to contract

We are constantly being conditioned in the world. One of the most evident examples is the learning of language. The child sees a chair and hears the word "chair"; afterward when he sees a chair, the proper word comes up. This is the natural way of learning a language and therefore is probably the best way of learning a foreign language, namely, by showing an object and at the same time giving the name of the object, or at least showing a picture with the name. A firm bond is thus established between the object and its name. This seems a far cry from the salivation of Pavlov's dog, but it is really a similar process.

In the laboratory we have had to use the conditioning process in working with animals in order to know what they are "thinking about". Suppose, for example, it is important in a certain experiment to know whether a guinea-pig can hear a tone of 18,000 cycles. How is it possible to find out whether he hears the tone or not? The answer lies in the conditioned response. We can give the guinea-pig an electric shock together with a tone, and then we can give him the tone without the shock. The guinea-pig shows changes in breathing and this physiological response can be accurately recorded. When the tone is sounded without the shock, if the guinea-pig actually hears the tone, there will be a change in breathing which had previously been produced by the shock and now has been transferred to the tone through the conditioning process. By this change in breathing it has told the experimenter that it has heard the tone just as well as an individual tells one that he has been frightened when he turns pale.

Fears may be very readily conditioned. We do not fear objects until we have had some unpleasant experience with them which causes withdrawal and other fear responses. Then the sight of the object or even the mere thought of it will call forth the emotion. In other words fears are not entirely innate and instinctive. Conditioning of this nature has been obtained in the laboratory and a classical instance of such experiments is the work of Watson.* Furry objects, snakes, etc. were shown to very young children who reached out toward them and handled them without hesitancy and with indications of evident pleasure. Then the experimenter frightened the child with a loud sound or some other stimulus, at the same time that the animal was shown to him. It was found that the fear reaction was very soon transferred to the previously neutral object. There is a prevalent idea that there is a natural instinctive fear of snakes. It is true that many persons are afraid of snakes, but a child who has never seen one is very likely to take it up in his hands and play with it. I have seen a child attempt to put a small snake in its mouth. It is apt to continue with this attitude toward the snake until it has had some unpleasant experience with one

* J. B. Watson and R. Rayner, Conditional emotional reactions, J. Exper. Psychol., 1920, 3, 1-14.

or has been frightened by its mother's own fear reaction. I have known of a case of such deep-lying terror of a snake that a mere mention of one would make the person turn pale. I discovered upon investigation that when this person was a child, her brother threw a snake at her. It coiled about her neck and caused her such terror that she never got over it. I might add that there are other factors in the snake situation besides actual unpleasant experiences which cause a certain dislike for this animal. In the first place it moves and acts differently from most other animals and therefore seems strange to us; and secondly, it is cold and clammy to the touch. Most animals of our acquaintance are warm-blooded until after death; therefore the cold clammy touch gives us a feeling of unpleasant strangeness.

One of the most recent experiments on conditioning which has come out of Russia is that of conditioning identical twins to see whether there is any difference in their responses.* In this experiment the child was put on its back and a sugared cranberry was held above its open mouth. The amount of saliva secreted at the sight of the cranberry was accurately measured. It was found that the mouth of one of the twins watered a great deal more than the other's. In other words the cranberry meant much more to the one twin than to its mate, which showed that it was very much more responsive. If there is this difference at the start, there is little doubt that the twins will develop very different temperaments even though they are identical twins.

We would probably not suspect many of the efforts of conditioning if it were not for the results of experimentation. For instance there is a very practical situation in regard to memorizing. It has been found that if we have memorized certain material in a particular situation, we can recall the material more readily if we happen to be in a similar situation. If we are accustomed to study in a certain room in the house, we will find that we can remember better if we are in that particular room because the various features such as chairs, books, pictures, etc. have been associated with the material we are learning and as a general setting act as an aid to recall.

Motivation, or the reason why we do things, is now being studied very thoroughly. One of the outstanding motivating forces seems to be the desire to overcome difficulties and obstructions. Even the very small infant will resist if its movements are obstructed. It may seem a long way from the infant's struggle to puzzle-solving, but there is a direct connection in the sense of a difficulty to be surmounted. Knowing how fundamental this motive force is, we should not be surprised that the brain tests, cross-word puzzles and other problems which appear in newspapers and magazines are so popular.

The desire to complete the task we have started is closely

* I. Kanaiev, Physiology of the brain in twins, Character and Personality, 1938, 6, 178f.

related to the desire to overcome difficulties. The fact that we have not completed what we set out to do seems to stick in the subconscious and to stir up our conscience with accompanying restlessness until we have accomplished our purpose. A very simple experiment has been conducted along these lines in the laboratory. A person is permitted to complete only one-half of a memory task and then later the individual is tested in regard to the recall of the material. Another individual is allowed to complete the task. It was found that the individual who had not completed the task frequently remembered the details better than the person who had.*

There are many other motivating forces such as hunger, sex, temperature, etc. An experiment upon the last named motivation was done recently.** A rat was put in the water at the end of a long water maze and required to swim in order to get out. If the water was above or below comfortable temperature, the rat would swim as rapidly as possible toward the exit. If, however, the water was at a medium temperature, it was apt to swim lazily about without any apparent urge to escape. It is evident that comparable situations exist among human beings. Any condition which is not favorable to the organism seems to act as a motivating force toward adjustment or escape. This characteristic of the individual to change situations which do not seem to be favorable to his existence is at the bottom of all so-called progress.

One of the most important factors in motivation is that of emotion. It is probably the greatest driving force that we have and if directed can serve a very useful end. William James once said something to the effect that if we have a pleasant emotion such as listening to a beautiful symphony, we should do something with it even if it is only to say a kind word to our mother-in-law. In the laboratory we have a fairly good means of measuring emotional responses. One such method is that of the psychogalvanic response. Electrodes are fastened on the hands of the subject and the wires are run through a galvanometer. When the individual is subjected to some emotional situation, there will be a deflection in the galvanometer, the size of which depends upon the strength of the emotion. When this experiment was first tried, it was thought that this deflection measured mental capacity. We know now that the change in the galvanometer reading is due to a change in the resistance of the tissues under the electrodes. When we have an emotion there is a discharge of nervous impulses along the autonomic nervous system, which causes such manifestations as sweat, changes in the size of the blood vessels, etc. It is these changes which cause a change in electrical resistance and in consequence

* K. Lewin, A Dynamic Theory of Personality, New York: McGraw-Hill Book Co. Inc., 1935.

** E. G. Wever, Water temperature as an incentive to swimming activity in the rat, J. Comp. Psychol., 1932, 14, 219-224.

a change on the galvanometer.* One of the most popular uses of this laboratory experiment is what is generally known as the lie detector, not because it can read the thoughts of an individual, but because it is an indication of his emotional state. Obviously when he is lying, he is apt to be more emotional than at other times, and it is this emotion which causes the deflection in the galvanometer and gives him away. It is not necessary for him to give any outward indication of the emotion; it is the subtle concealed physiological responses which the instrument measures and which makes the experiment of such value. It might be said, however, that these results must be very carefully interpreted by an expert for an innocent person is apt to be as emotional as a liar.

Another form of emotional response that has been given considerable attention in the laboratory is that of facial expressions under conditions of emotion.** We have been especially desirous of ascertaining how well a person can judge emotion from facial expressions. It may be said that most of our facial expressions are what could be called socialized. When we want to have a person think we are pleased, we put on what is generally known as a pleased expression. If we wish to frighten someone, we assume an angry expression even though we are not angry. Children soon learn to use emotional expressions in order to get what they want and these responses become increasingly developed in the life of an individual. Facial expression is a form of language comparable to a conventional language for it consists of symbols by which we frequently make known our desires. Inasmuch as these emotions are socialized, it is to be expected that it is possible to read emotion from the facial expression with fair accuracy. However, as usually the whole body is involved in emotional responses, such as the tilt of the head, movements of the arms, legs, etc., it cannot be expected that the facial expression alone will give an unequivocal indication of what the actual emotion is.

One of the basic emotional responses which has been investigated is that of the startle. Most of us undoubtedly believe that a startle is a sort of jump away from the stimulus. Slow movies, however, have shown that the startle response, which is a basic physiological reaction, is something like a protracted yawn.*** It starts with movements of the hands and arms, and ends with throwing back the head and opening the mouth, with finally a general relaxation to the original normal position. This is a very good example of the fact that we cannot always tell from our

* H. R. Crosland, Objective measurements of emotion, Univ. of Oregon Publ., 1931, 1, No. 3.

** H. S. Langfeld, The judgement of emotions from facial expressions, J. Abn. Psychol., 1918, 13, 172-184.

***W. A. Hunt, Studies of the startle pattern: II Bodily pattern, J. Psychol., 1936, 2, 207-213; C. Landis and W. A. Hunt, III Facial pattern, J. Psychol., 1936, 2, 215-219.

own introspection what we are actually doing. So far as I know, no one had thought that so many muscles were involved in the startle response or that the response had such a standard pattern for all individuals until the slow movie had been inspected. The discrepancy with what we think we do and what we actually do appears in many situations. Expert golfers, for example, were thought to break their wrists at the start of the up-swing. Slow movies showed that the experts did not break their wrists until the club had travelled some distance from the ball. Another instance of what we think we do and see and what actually happens is that of the trotting horse. It was not until movies were taken of its action that it was known exactly what the sequence of movements was. It was then found that the classic representations of a trotting horse were false.

The field of perception is too large for detailed description here. One of the most recent and interesting series of experiments was concerned with an analysis of what actually happens when we perceive movement. The results of these experiments are intimately related to the perception of movement which we get in the moving picture. These movements, as is well-known, are not real movements at all, but mere illusions of movement, since all we have objectively is a series of still pictures. It was possible in the laboratory thoroughly to analyze these illusory movements and to find out exactly under what conditions the best movements could be produced. One of the earliest laboratory apparatus many years ago produced movements in the same way in which the Mickey Mouse pictures are produced today, and although it was a long time before the moving picture film, the underlying principle was the same.

The field of sensory psychology is also a very large one. The most valuable work has been done upon the nature of vision and of audition. Smell and taste and the other senses have also been thoroughly investigated, and results of much practical value have been obtained. One example is the work which has been done upon the action of the semi-circular canals, which give us the sense of balance and rotation; this work has led to practical tests for aviators.

Much of the sensory work in the laboratory comes very close to physiology. Some of the most important work of this nature has been done in the field of brain localization. Most of this work naturally has been upon monkeys and rats. It has been found that the mental functions are not always sharply localized in the brain and that when one part of the brain is destroyed, an adjacent part can take over its function.

Another very important research along physiological lines was started a few years ago in the Princeton laboratory.* Work had previously been done on the measurement of the nervous impulse. When this

* C. W. Bray and E. G. Weaver, The nature of the acoustical response: The relation between sound frequency of impulses in the auditory nerve, J. Exper. Psychol., 1930, 13, 373-387.

impulse travels along the nerves, there is an electrical effect which can be measured by means of electrodes placed on the nerve and in circuit with the galvanometer or other measuring device. Knowing this fact the experimenters, after having anesthetized a cat, placed the electrodes on the auditory nerve of the animal and ran wires first into an amplifier to increase the strength of the current and then to a set of ear phones in a distant room. One experimenter talked in the ear of the cat and the other listened in the ear phones. It was thought that they would hear some kind of a clicking sound but nothing more than that had been expected because it had been assumed that one nerve fibre could produce only about 200 vibrations per second. Instead of the click, the experimenter at the ear phone was surprised to hear distinctly the voice of the experimenter who was talking in the cat's ear. In other words they found that they could actually take off the nerve current from the activated ear of the cat and could hear through the phone what the cat itself would have heard. This work is still going on in many laboratories and it is quite probable that many important facts in regard to nerve current, and the auditory nerve in particular, will be discovered and will, among other things, be helpful in treating defects in hearing.

Some few years ago a German psychiatrist fastened electrodes on the head and ran the wires from them through an amplifier to a galvanometer. He found that when the individual's mind was at rest, there was a rhythmical deflection of the galvanometer of about 10 per second. A few years later this published work was re-discovered and now a great many laboratories are engaged in research upon the so-called "brain waves".* The "ten-rhythm wave" is called the Berger rhythm after the German psychiatrist, or simply the Alpha rhythm. It is interesting that if a light is flashed in the eyes of an individual in repose, the Alpha rhythm stops. On the other hand this rhythm occurs when the individual is in a very deep sleep. At the present time the real nature of this electric phenomenon of the brain and the causes of many of its variations are not accurately known. Research in this direction, however, bids fair to produce valuable results, for a better knowledge of the physiology of the brain and thus of a better understanding of the nature of our minds. In conclusion it might be stated that the trend of experimental psychology has been increasingly toward the borderline between psychology and physiology.

* A. L. Loomis, E. N. Harvey and G. Hobart, Electrical potentials of the human brain, J. Exper. Psychol., 1936, vol. 249-279.

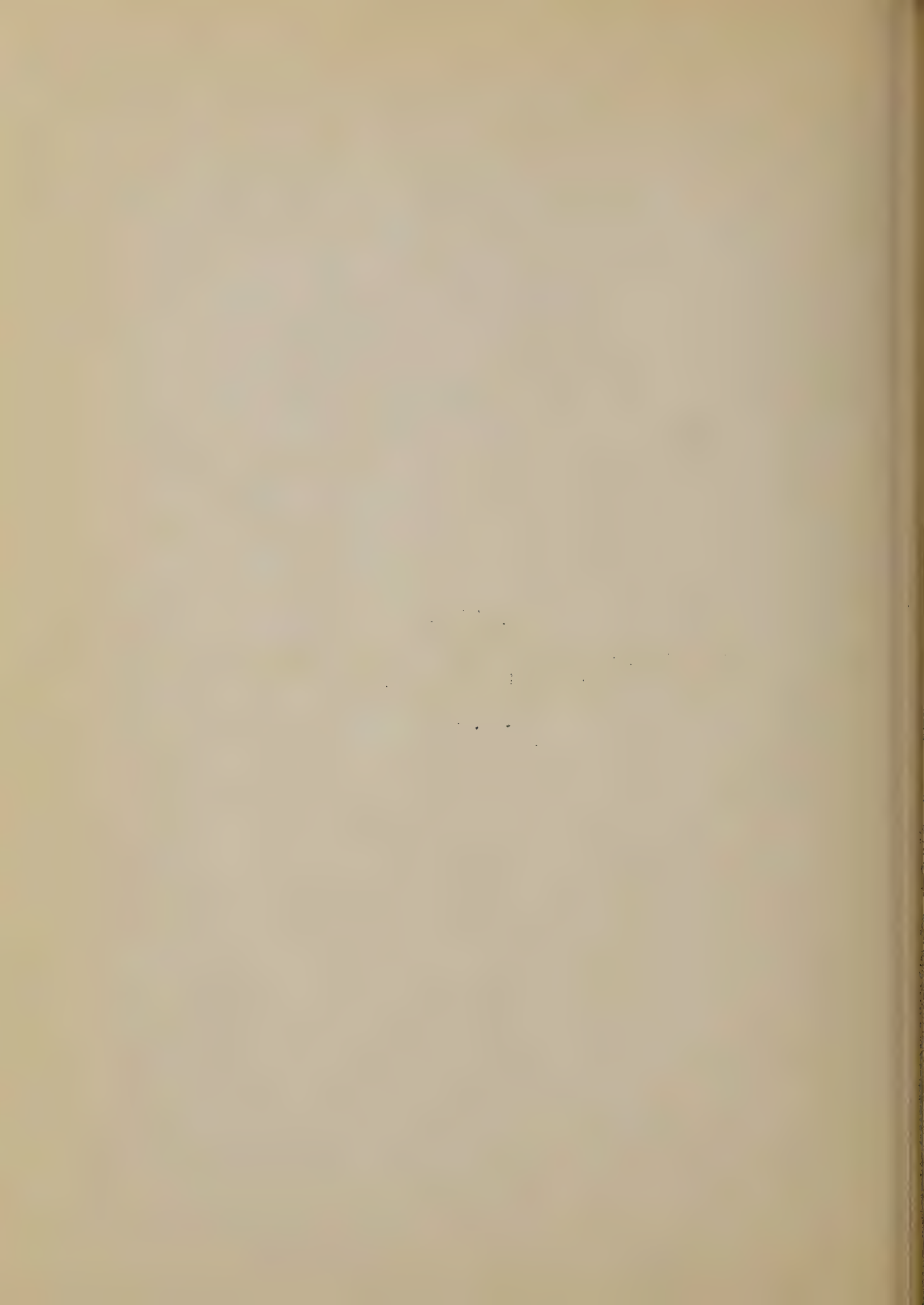
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Lecture V

ON THE FRONTIERS OF THE MIND: RECENT RESEARCH IN
EXTRA-SENSORY PERCEPTION

J. B. Rhine



ON THE FRONTIERS OF THE MIND: RECENT RESEARCH IN
EXTRA-SENSORY PERCEPTION

by
J. B. Rhine

I would like to make one minor correction before beginning this talk today. As you know, the title of this series of lectures is "Psychology Today." I want to point out that what I am going to talk about is not psychology today. It was not psychology yesterday, and it is a problem yet whether it will be psychology tomorrow.

As Dr. Kaufman pointed out in his introduction, it is today the subject of a great controversy. Articles are appearing at the rate of about one per week, criticizing the research about which I am going to speak. Fellow psychologists are making talks at psychology meetings aiming to point out what is wrong with it. In general we are in the midst of a great battle over the subject of this lecture, the recent research in extra-sensory perception.

Because of the very controversial nature of this subject, I would like you to have an opportunity at the end of this period to ask questions; and I shall shorten my lecture in order to make this possible. I should like you to have the opportunity thus to take an active part in the controversy yourselves.

What is the issue at the basis of this heated dispute? Very concretely and simply, the question may be stated thus: Can anyone reliably name the symbols on a pack of cards that they cannot see or perceive with any of the other senses? Put in that simple way, it is perhaps surprising that anyone should be much concerned over the question. Either this is possible or it is impossible, and it ought to be simply a matter of finding out by actual experimental trial. If you have an experimental turn of mind, you would likely be impelled to take a pack of cards and find out for yourself, rather than spend much time in fruitless disputation.

In order to find out why the subject represented by this question of extra-sensory card-calling is the issue in a pitched battle, we have to go back for a brief historical reference. As in many other issues, we find that our beliefs today on this question have a very ancient origin.

The reason psychologists are so stirred up on the question of whether a human being can successfully call the order of cards without the guidance of his recognized senses, was that that is the very thing that psychologists have been trying to get away from for years and years -- indeed, for centuries. Ever since the beginnings of psychology it has been necessary to try to get away from all claims of this character, which have commonly been associated with religious beliefs. Some extra-sensory mode of perception, the capacity to perceive beyond the limits

of sight and hearing and the other senses, has been the essence of many systematic theological systems. The mind or spirit, according to these systems, has been able to go out beyond the range of sense organs and grasp something which the senses cannot. These unusual powers, supposedly mystical or supernatural, have been widely recognized by practically all peoples until the advent of science has led to their being dismissed as mere occult superstition.

The rise of a scientific study of the mind, of an incipient psychology, led to a barrier being thrown up against this type of belief. The most familiar form this barrier has taken is the dogma of John Locke, that nothing enters the mind except through the channels of sense. Nothing gets into the intellect that was not first in the senses. This dictum became the tradition of our scientific view of mind. We all grew up through the schools to take it as a natural assumption. It has become a frontier of our concept of the nature of mind, and every psychologist today inherits this established tradition unless he is for some reason led to challenge the very basis of his orthodox teaching.

It is, however, by questioning just such long-established traditional beliefs that science has often made its greatest advances. The established astronomy of Copernicus' time was the Ptolemaic system, and Copernicus had to question the view of the most learned men of his day. In the day of Galileo's famous experiment on falling bodies, Aristotelian physics was the prevailing traditional view. Harvey in his discovery of the circulation of the blood had to question the old theories of Galen and others. Down through the history of science has gone the same great march of doubt, reopening old questions in the light of new experiments. Thus Darwin challenged the traditional beliefs about creation, and Einstein startled the world with a new theory of the mechanical universe in the face of a tradition of Newtonian mechanics as old as that of Locke's views against extra-sensory perception.

It would seem clear, then, that in reopening the question of an extra-sensory mode of perception investigators today are only doing what has been so creditably done throughout the long history of science. When we set to work at Duke University eight years ago to try to find out whether there was any way of apprehending knowledge of events without the use of the recognized senses, we were doing what is the routine thing of the scientific explorer in any field.

We were not, however, in any very marked degree pioneers in this exploration; and we do not claim the credit of priority on any of the matters of which I shall speak today. More than fifty years ago academic men were investigating this very question, men whose age and academic standing were in many instances far beyond that of any of us engaged in this work today. You would, if there were time to review the history of this subject, recognize the names of some of these eminent pioneers.

I confess with some regret that they were not psychologists, as

they should have been. The fact of the matter is that with two or three notable exceptions leading psychologists were more disposed to shoot over the fence at these investigators, than to lend a hand in the investigation. A little later, however, due largely to the influence of that broadminded psychologist, William James, there were some investigations made in psychological laboratories with a view to finding out if extra-sensory perception occurs. There were some card-calling experiments conducted at Harvard by the late Dr. Troland, who later reached considerable eminence as a psychologist. He did not, however, apparently put much enthusiasm into his research; and after a few hundred trials he discontinued, although his results must be regarded as slightly favorable to the hypothesis of extra-sensory perception.

Another psychologist, very well known in his day, conducted some similar experiments but did not publish his results. I refer to the late Professor Titchener of Cornell. My information comes from one of his students who received a Ph.D. degree under his direction. The results of his unpublished tests were, according to my information, most encouraging when judged by our standards. But it appears that Professor Titchener, not being familiar with the method of evaluation of such results, did not appreciate their importance and accordingly was not satisfied with the results, demanding still more nearly perfect performance; and this was not attained.

A third attempt in this country was made by a psychologist at Stanford University, the late Professor Coover. A huge volume on this subject was published by Professor Coover over twenty years ago, in which he reported the conclusion in effect that Locke was right; his evidence indicated no extra-sensory perception. However, several other psychologists have since worked over Coover's results, and they find that he actually had results distinctly favorable to extra-sensory perception. His way of presenting his results tended, however, to obscure these favorable findings.

Over in Holland another set of psychologists working in the early 1920's took up the question of extra-sensory perception and conducted an investigation which to my knowledge has never been seriously criticized. It was rather short, consisting of less than 200 trials; but these trials were made under excellent conditions with very clear and striking results. The conclusions of the investigators, Professors Heyman, Brugmans, and Weinberg, were that some telepathic (that is, extra-sensory) mode of perception was demonstrated.

In this country the recent wave of interest in the subject owes its beginning to Professor William McDougall, now head of the Department of Psychology at Duke University. When he came to Harvard in 1920, Professor McDougall found a small unused research fund and was able to put it to use. Two men worked under him during the period of his tenure at Harvard. The first, Dr. Gardner Murphy, now at Columbia University, did not reach definite conclusions but was evidently sufficiently

encouraged to have become an inveterate investigator of this problem, to the extent that he is one of the active men in the field at the present time, approximately eighteen years later. The second investigator, Dr. G. H. Estabrooks, of Colgate University, published a report of card-calling tests in which he was led to the conclusion that telepathic perception must have occurred. (I am told, however, that two later series have been inconclusive.)

Later when Professor McDougall came to Duke he made it possible for a number of his colleagues, including myself, to undertake a fresh attack on the question whether ESP (that is, extra-sensory perception) can be demonstrated. Professor McDougall, himself a veteran explorer in the field of psychic research, had been convinced of the occurrence of this mental capacity on the basis of the earlier English research. His interest and encouragement were an essential part of the beginnings of the ESP experiments at Duke.

You will see from this brief sketch of the history of ESP that when we began the experiments at Duke University we were only taking up what had long been an actively investigated problem.

It is true the earlier work done prior to the Duke research in ESP had gone largely ignored both by the general public and by science. The reason for the attention given to the Duke work is partly, I think, due to the greatly increased interest in science on the part of the general public today and the better cooperation on the part of science writers in bringing modern discoveries to the attention of the general public. If there is anything in the Duke work itself which justifies greater attention than that done previously, it is the much greater amount of work done, the very simple methods, and the easy quantitative estimation of the test results. With this brief introduction, let us turn now to see exactly what the Duke ESP research actually consisted of.

Let me describe a very simple beginning experiment. A student from one of my classes who volunteered to take the tests was seated at a table, a shuffled pack of cards placed before him face down. The cards numbered twenty-five, consisting of five each of five simple suits, containing simple geometric designs. The cards were made of heavy opaque cardboard and were carefully selected so as not to give cues from the back. Across the table from the subject was an experimenter with pencil and record pad. The subject was asked to attempt to name the top card of the pack, and as he did so, a record of the call was made and the top card removed. He was then asked to call the next card, and did so until the twenty-five cards were called. Then the experimenter turned the pack of cards over and checked them against the list of calls recorded, with the subject looking on as a witness.

You may wonder whether these conditions were good enough to rule out the possibility of sensory perception. As I stated, these were beginning conditions and were approximately the same as obtained

in a careful card game. The plan was to introduce further safeguards only if there was some real reason for doing so; that is, if the subjects did better than chance in their calling of the cards.

And that is just what they did! From the beginning of the card tests there were slight positive deviations; that is, the calling was a little better than chance. Soon, however, we found a few special subjects who stood out above all the others in their scores. We know what a good score is by reference to the average expected by chance alone. This is five hits per twenty-five trials; that is, on the average the subject should obtain five or very close to five if he made a long series of trials and got only chance results. However, when we found subjects who could, in long series of trials, average nine and ten and eleven, we knew very well that something besides chance was operating in these tests. After working for three years and including all the tests that were made, the average for over 85,000 trials was seven per twenty-five. According to the mathematics of probability, the odds against such results occurring by chance are so great as to require many hundreds of digits to express them. This amounts to as near to certainty as we can expect to get.

There have been, it is true, many questions raised about the mathematics of probability as applied in these tests, but the most expert mathematicians of probability have given their approval of the methods used, and in a historical moment, the president of the Institute of Mathematical Statistics in December, 1937, issued a statement ending with the following words: "If the Rhine experiments are to be criticized, it must be on other than mathematical grounds."

I will not go into more detail to state that the results have been clearly above chance. It is generally conceded by critics and friends alike that there is no longer any doubt on that score.

But let us proceed to see how adequate were the conditions in these tests which excluded the possibility that the subject might obtain sensory cues or might in some way obtain a knowledge of the cards without requiring extra-sensory perception. What were the actual precautions taken to insure against sensory perception? The actual methods and precautions were many and varied. We will have to confine ourselves to a few instances.

One of the earliest methods used to keep the subject from getting sensory cues from the cards was to seal the cards up in opaque envelopes. This method has been used successfully and the results that have been obtained have been clearly beyond chance. The results compare favorably with those obtained with open cards under similar conditions.

Another general method used for avoiding sensory cues was to place the pack of cards behind an opaque screen. There are various kinds of screens adapted to the different experimental techniques. A

considerable amount of research has been done under these conditions of screening, and in this work are to be found some of the better score series. The entire work with screens is far above chance.

A third general set of conditions of precaution against sensory cues, and unquestionably the best of all, is that of setting up the cards to be called and the percipient with such distance between them as clearly to exclude all known sensation, or to combine distance and intervening walls in such a way as to make the experiment entirely safe on that score. Again a large portion of research has been done under these conditions; and the highest results for a long series that have ever been obtained were produced at a distance of more than a block, with subject and cards, of course, in different buildings.

Let me go into some detail on a few of these cases. But in doing so I should like to make clear that I am not merely selecting the good ones and forgetting all about the ones which are not so good. I have summarized all these, good and bad, in a recent article published in the December, 1937, number of the Journal of Parapsychology. There you may turn to see just what the results are like as a whole. I shall refer, of course, to some of the more interesting and striking of these cases, but it is clear that when they are taken all together the results are far above what would be expected by chance alone. You will note, too, that I refer to work done at other universities besides Duke; for the ESP research has aroused interest in many places, and fortunately other psychologists have taken it up and repeated the tests on their own subjects. The large majority of these have found the same results as we have at Duke. It is true, not all have confirmed the Duke results, and this represents one of our many problems. But we feel that so long as the majority, or even so long as a substantial number of other investigators, obtain results similar to our own, we must be satisfied until we learn more about the peculiar difficulties inherent in this type of investigation.

Let me first take you back to one of the earlier experiments conducted at Duke, in which we had the cards in one building and the subject who was trying to call them, over in another building at least a hundred yards away. This is the now well known Pearce-Pratt series, Dr. Pratt being the experimenter and Mr. Pearce the subject. Before beginning the test, the experimenter and the subject would set their watches together and agree on when the test should begin. The subject would then leave for his room in the Duke Library Building, and Pratt would shuffle the two decks of cards to be used. At the appointed time the card would be lifted from the deck and placed on the center of the table by the experimenter. Over in his room, the subject would put down on a slip of paper his impression of the symbol on the card. At the end of a half-minute, the card would be removed; and at the beginning of the next full minute the second card would be placed on the center of the table. The order of the cards would be kept, and at the end of the run of 25 the experimenter would make a record of the order of the cards in the pack. This was the first time the experimenter looked at

the faces of the cards. The test was thus a test of pure clairvoyance or the extra-sensory perception of objects, as distinguished from telepathy, in which the subject tries to perceive what another person is thinking of. During the first twelve times through the pack, at which time the experiment was discontinued, the average was 9.9, as against the chance expectation of 5. This average is beyond question clear evidence of the operation of something beyond chance. Such an average by chance alone would not, to put it mildly, be expected once in a million times.

During a later session it was suggested that someone might call into question the good faith of the experimenter, and so important a series ought to have another observer present. Therefore I myself stood watch over Dr. Pratt while he was conducting the tests, in order that I could add my testimony to his. During the six runs which were made before we discontinued that series, the average was 9.3 -- fairly close to what had been made before. In all these cases both the experimenter and the subject sealed up their records and independently turned them over to me before they got together to discuss results. Later the distance was extended to 250 yards and the results became very uneven. On some days they would be just as good as they had been previously, but on others they would drop to chance or even below. Even so, they were still well above chance; and the combined series of work done by this subject under those conditions represents 74 times through the pack with an average of 7.5. The odds against this average being obtained by chance alone for so long a series would require a figure of 27 digits to represent. You will agree, therefore, that there could scarcely be anything more certain in the universe than that this was not a chance occurrence.

Recently we have had two statisticians recheck this entire series, and they found only two mistakes in the scoring and checking; and these cancelled each other in the same run, so that no single score was changed. The mathematical evaluation is entirely approved, and it is difficult to see how else we can explain these results unless we suppose some extra-sensory mode of perception was possible to the young man taking the test.

The fact that there were 74 runs made in this series calls to mind the more recent work of Dr. Riess, a psychologist of Hunter College, New York, who also conducted a series of 74 runs with a single subject. And Dr. Riess obtained even higher scores than we obtained at Duke. Before I tell you of the amazing results obtained by Dr. Riess, let me give you a word or two about his experimental conditions. They too are among the best we have had. They are very similar to those of the Pearce-Pratt series, except for one particular. Dr. Riess as experimenter looked at the card while the subject was attempting to get an impression of it, and therefore we must recognize that the subject might have perceived his mental image instead of the card, or may have relied upon both image and card. Dr. Riess's subject had had a reputation for unusual abilities in the line of extra-sensory perception

when she was brought to his attention. Dr. Riess was a pronounced skeptic so far as ESP was concerned, but consented to investigate her. The tests were arranged on the same time schedule as that which the Pearce-Pratt series had followed. By telephone call prior to the test, two watches were set in harmony. Dr. Riess, however, did not tell his subject at the end of the run what success she had obtained. In fact, she was not told anything at all except that Dr. Riess was interested in the results and wished to continue. During these tests the subject was located in her home and Dr. Riess in his. The distance was something over a city block.

It will be recognized at once that here, as in the case of the Pearce-Pratt work, all possibility of sensory cues between the subject and the experimenter or between the subject and the cards was ruled out. When Dr. Riess checked up his results for the 74 series, he found an average of over 18 hits per 25. This is the most remarkable series in the history of the ESP research.

There is a curious sequel, however, to this outstanding series. The subject had not been in good health and was given treatment for hyperthyroidism. After a period of treatment, Dr. Riess secured another short series of tests with her. The average was only a very little above chance for the ten runs he was able to make before he had to discontinue.

While this New York series is the climax as far as actual score averages go, it can still be improved on in terms of actual conditions of safeguard by a series recently made by another New York psychologist, Dr. Lucien Warner. Challenged by critics of the ESP research, Dr. Warner and his assistant, Mrs. Mildred Raible, obtained a series with their most successful subject under conditions that are well-nigh ideal. They had the subject locked in a downstairs room while they, in an upstairs room not immediately above, turned over cards selected at random. They drew a card each time they received a signal by a one-way electric signalling system indicating that the subject was ready. Each time they drew a card they scored it and returned it to the pack and drew another one by a random cut. They went on in this way, with the subject keeping an independent record, until 250 cards were called. The experimenters themselves did not look at the cards until after the signal indicated that the subject had actually made and recorded her call. Thus telepathy or the extra-sensory perception of images in the minds of the experimenters was ruled out, as in the Pearce-Pratt series.

The average in this well-controlled experiment was 9.3. Again for this average there is not a probability of one in a million that it would occur by chance alone.

Or again, we might go into interesting cases turned up by psychologists elsewhere. Going westward, we find at Earlham College, Indiana, another outstanding confirmation of the ESP work. Miss Humphrey

and Dr. Clark discovered that when they put their best subject to work with their cards behind a screen, she averaged 9.3 through 50 runs through the pack. Her work without the screen had averaged 8.3. Still further west, at Tarkio College, Missouri, Mr. MacFarland and Dr. R. W. George, two psychologists, put 13 subjects through over 20,000 trials, with an average of 7.1 per 25. And still further west, in Colorado, Miss Martin, a psychologist, and Miss Stribic, a mathematician, obtained an average of 6.89 with a single subject in 1,000 runs or 25,000 single trials.

In all these cases I have mentioned, the cards have not been within range of vision or touch of the subject while the test was going on. No matter how imperfect the backs of the cards may have been or how clever the subjects might have been at sleight-of-hand tricks, they could not have been guided by sensory cues on the cards. In most of this work either double witnessing of the checking by two experimenters, or rechecking of the records by another experimenter, has been carried out, so that any errors in recording or checking have been eliminated.

It is our duty as scientists to consider every other possible explanation before we suppose anything which has not yet been recognized in science as a valid principle. This is true of extra-sensory perception. We have considered whether chance or sensory cues or errors in recording have been possible alternatives. We do not see how they can be. We have presented all the data, and therefore errors in selection of good results and omission of bad cannot have influenced our total averages. The only alternative that is left is that there has been some deliberate chicanery practiced on the part of the experimenters and subjects involved. This is scarcely a reasonable hypothesis in academic science, and I think you will readily recognize that there are too many persons involved for that hypothesis to be seriously entertained. Last year alone there were eighteen confirmatory papers, involving ten different university laboratories, as well as some outside research. Few people are going to maintain that all these people are either incompetent or fraudulent. It looks very much, then, as if we had to face the fact that some people can under some circumstances perceive what is hidden to the senses themselves -- that extra-sensory perception sometimes occurs.

I mentioned earlier that there were some people who had tried to repeat these tests, tried to find examples of extra-sensory perception, who had failed. I will not take time to go into details on this, except to say that there have not been so many of these, to my knowledge, as there have been others who have succeeded. But we are puzzled about those who cannot get results, and we are trying to find out why it is. There is one piece of work that may throw a great deal of light on this which I will take time to present here briefly. It will shortly be in print and will be presented in a few days at a meeting of psychologists at Knoxville. Accordingly I am at liberty to speak of it.

This work was done by two experimenters, both from the Duke Parapsychology Laboratory. One of these, Miss Price, had been successful in getting scores above chance from a considerable number of subjects whom she had tested, mainly children. The other, Dr. Pratt, while he had had good results earlier with two subjects, had for a long time been entirely unsuccessful in getting scores above chance. He had worked with the same type of subjects that Miss Price had. Here was the problem, then, of failure and success as experimenters right in our own midst. We persuaded the two to work together, using the same subjects and both being responsible for the safeguarding and checking. The results are very interesting. They fall into two periods. During the first period Dr. Pratt asked Miss Price to try to give her assistance to one-half of the subjects and to let the other half fall to chance as they would be expected to do for him. That is, whatever it was that she had in the way of personal influence she was to exert only on one-half of the subjects and to use the other half as controls. This did not at all please Miss Price, since she had too much personal sympathy for the children whom she was asked to neglect; and although she had some temporary success doing this, she soon became strained and the whole thing was a failure. The results were only a little better than they had been for Dr. Pratt himself.

Then Miss Price asked that she be allowed to treat all the subjects alike and do what she could for all of them to get them to score well. The result was that they did quite as well with both the experimenters present as Miss Price's former subjects had done for her working alone.

What this means for those experimenters who have not been able to find subjects who can score above chance is that they must try getting someone with the social gifts of Miss Price to handle the subjects during the tests and provide a more suitable "atmosphere" for these apparently delicate abilities.

Now, if I had not had to spend so much time dealing with the critical questions which I know will arise in your minds, I should have liked very much to have gone on to say something about the bearing which these tests may have upon related fields. But naturally we have to make sure about the phenomena before we can discuss them with any degree of security. The same is true in our research. We have spent a great deal of time repeating, and repeating again, experiments which can do little more than to establish over and over again the reality of extra-sensory perception. Many of us think it would be much more interesting and profitable if we could spend our time finding out more about the nature of this newly-found ability of the human mind. When it becomes a recognized field of study, when enough hands have been turned to the research to ensure its future, many of us will feel free then to go on to these further stages.

At the same time, incidental to the more exploratory research,

we have already found a number of things which indicate something of the nature of ESP. A few remarks by way of outlining of these indications may be worth while.

For example, there have been a number of experimental indications that ESP is not like sensory perception. Big symbols are more easily seen by visual perception than small. Not so with ESP. Distance cuts down sensory perception but does not seem to affect ESP. None of the barriers that have yet been interposed between subject and object has affected ESP. But many if not all of them would have eliminated sensory perception.

There does not seem to be any fundamental difference between the ability of an ESP subject to perceive objects such as cards or purely mental images of these objects in the mind of another person; that is, telepathy and clairvoyance seem to be on a par as far as the evidence goes. The abilities do not seem to be acquired or improved by the usual processes of learning common to sensory perception. Various drugs, both stimulant and narcotic, affect ESP much as they affect higher thought processes, and affect it more quickly than they do sensory perception. In other words, while a subject who is almost asleep from a large dose of sodium amytal can still see, hear, smell, and taste, he has lost all his ESP ability.

These are some of the main points that stand out from the relationships turned up in the explorations into the nature of ESP. For further details and for further research I must refer you to the Journal of Parapsychology, which we have established at Duke University to deal entirely with this field of research.

One of the oldest problems of the race has been closely tied up with this question of ESP: The question of whether the future can be foreseen. You will see at once that it is simply the question of whether time, like space, will fail to be a limiting condition in the ESP tests. It is argued by many that if space does not limit ESP, neither will time be found to do so. It is more than four years since we launched this branch of the ESP research -- ESP and the future. We have at last begun to publish these researches. They will appear in a series of articles advancing step by step into the complexities that we have found in trying to investigate this question of precognition. Suffice it to say here that what we have published does not by any means close the question. We have found something that at first looks very much like precognition. We have found that the same subjects who have done well in the regular ESP tests can call packs of cards before the experimenter shuffles them and can get better than chance results in these predictions.

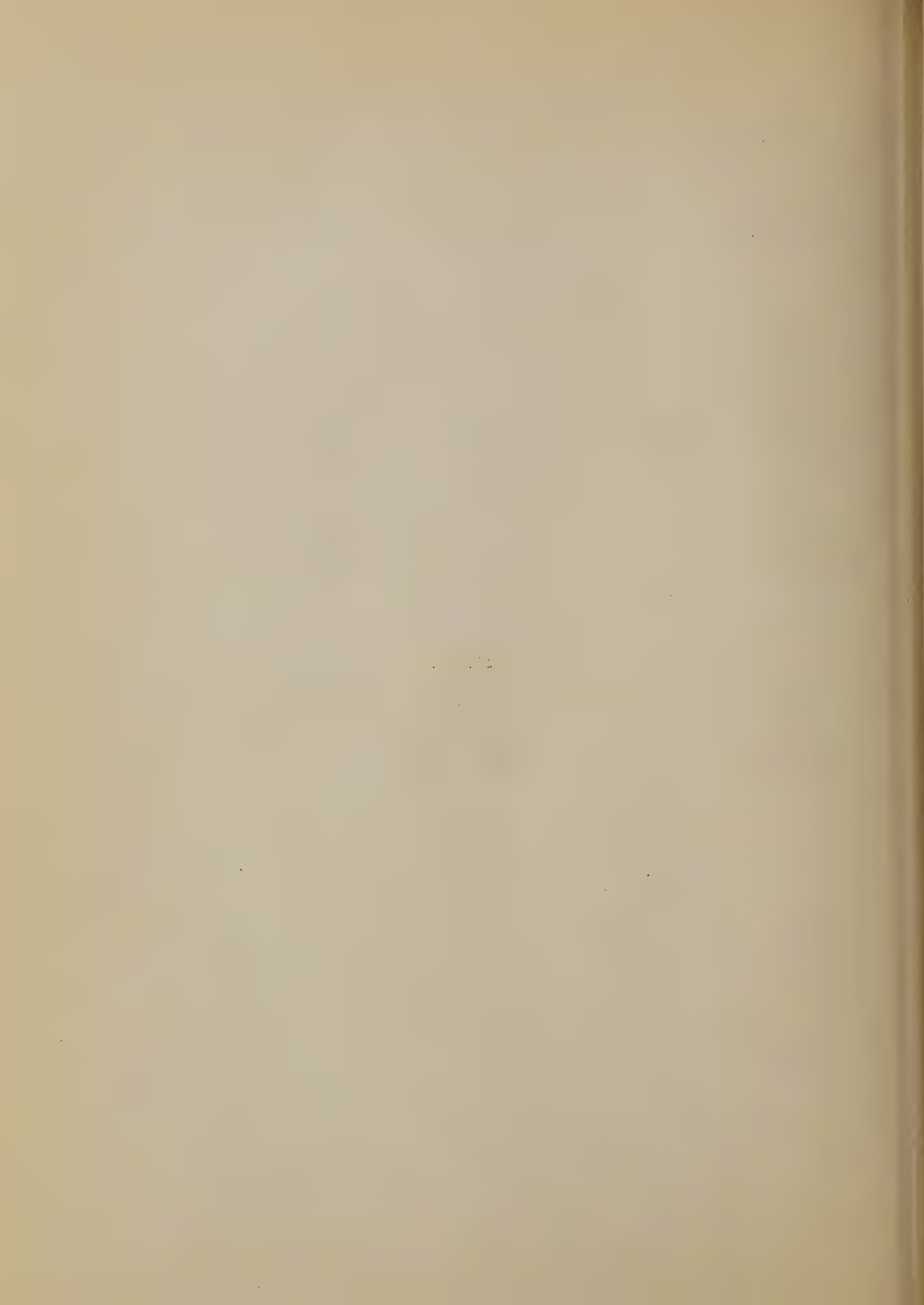
No one, I think, will dispute the fact that this opens up for us not merely a new range of controversy -- for here is one of the most revolutionary issues with which science has ever been confronted -- but, what is much more interesting and important to us who are experimenting

with it, one of the most fascinating and fertile grounds for research that have ever been opened up for investigation.

Lecture VI

THE GROWTH OF OUR SOCIAL ATTITUDES

Gardner Murphy



THE GROWTH OF OUR SOCIAL ATTITUDES

by

Gardner Murphy

The relation of psychology to the social sciences is one of intimate interdependence. I am going to try to look at certain broad problems which relate to people in groups which could well be approached by sociology, economics, history, political science, and so on; problems which we, however, as psychologists try to see in terms of the behavior of individual human beings. The emphasis is characteristically an emphasis in which we make use of all that we know about the living organism as discovered in laboratory work, regarding the environment of that living organism as the social order which the social scientist studies.

The special problem that I want to talk to you about, the growth of our social attitudes, is one which shows this double approach, the sociological approach and the psychological approach, as clearly as any.

Suppose, for example, that you wanted to find out what makes farmers radical or conservative. Suppose that you wanted to find out what it is that spreads radical or conservative sentiment from one region of the country to another. You have typical investigations carried out by a sociologist and political scientist. Let us mention, for example, the studies of Stuart Rice, who has shown very clearly the relation between certain forms of political radicalism and the economic situation of the farmer, for example, soil, rainfall, general considerations of climate and of migration, and you find very beautiful statistical methods developed by which it has been possible for Rice to show in what way and at what rate political radicalism of various forms diffuses from one region to another. We find, for instance, the effect of a shopping center such as Grand Forks, North Dakota, or Butte, Montana, in accelerating the rate at which farmers influence one another over the area. He computes carefully the average index of radicalism per county, as shown when a man splits his ticket in order to vote for the more radical of two candidates when this happens, in the gubernatorial ticket, to be a Republican and in the senatorial ticket to be a Democrat. The split ticket is one of several possible indices of radicalism. Rice has made it possible to predict to what extent the shopping center accelerates the dissemination of radical or political sentiment from one county to another.

The psychologist has to keep up with this kind of work. He regards it as his job to understand in a broad way the trends of sentiment throughout the country. He happens, for example, to be very much interested in the work of Gallup, which undertakes to give us the answer to certain broad questions about public opinion, section by section, week by week.

Nevertheless the essential job of the psychologist begins, it

seems to us, where the sociologist and political scientist leave off, namely, with a careful study of individual behavior mechanisms. I may illustrate by a familiar reference to Walter Lippmann's Public Opinion which you will recall has a good deal to say about those stereotypes or "pictures in our heads" which serve to control much of our political behavior in the absence of detailed and accurate information. We form, because life is short and information is hard to get, convenient pigeon-holes in which data are to be placed, and on the basis of a stereotyped idea of, let us say, the ward politician or a research microscopist, or a radio announcer, we proceed to judge the character of all members of a class in terms of the picture in our heads.

Now, here is a concept which can be used by an experimentalist to give us light on the way in which particular behavior mechanisms function. We have, for example, an investigation in which a series of pictures from a newspaper is arranged with various brief captions; one is labelled "United States Senator," one is labelled "journalist," one "banker", one "laborer", one "Bolshevik". The subjects, in one case Dartmouth students and in the other case farmers at a grange meeting, are supposed to tell who the individuals are by appropriate labels.

I need hardly tell you that stereotypes have a magnificent opportunity to function here, the Dartmouth students and the farmers being equally generous in their assignment of such titles as banker, for example, to those who are presented in excellent, socially acceptable, garb. There were, however, some cases in which the functioning of these pictures in our heads was a little unexpected. For example, it happened that Mr. Krassin, who at the time held a responsible position representing the Soviet Union, had a Van Dyke beard and a wing collar, which led to votes as United States Senator.

Stereotypes play an overwhelming part in American political thought. But it is not enough for the psychologist to know that such stereotypes exist; he must see how they arrive, how they can be controlled, and under what conditions we may make our stereotypes lead us to better rather than more crooked thinking.

A closely related concept which we find is of great importance as a clue to social behavior is the concept of the "frame of reference". I want to illustrate this from a very simple laboratory study in which I among many of my colleagues, acted as a subject. This experiment is familiarly known as the study of the auto-kinetic effect. Now, I will tell you what happened to me.

I went into the laboratory and I was made to sit down in a dark room. After my eyes had become accustomed to the dark, I was told that I would see a point of light and that after a while this light would begin moving. After the light had moved, it would go out, and after it had gone out, I should tell how far it had moved. When the signal was given, the light, sure enough, began to move and it moved in my case

Murphy

from 6 up to as much as 12 inches on different occasions. This light is somewhat like a firefly, visible against a perfectly black background. At the end of the experiment, the subject is shown by good light the apparatus, which consists of a small metal frame with a tiny aperture through which a steady light has shone all the time without the possibility of moving as much as a 64th of an inch; but the light will "move". It will move because under ordinary circumstances the subject uses in his perception a frame of reference based on contact with the real world, but in the case of the dark room -- which represents typically a man dealing with social problems -- he uses an internal frame of reference.

Now, for example, the experimenter told me that the light would move to the right and I was to determine how many inches it moved. It moved from 6 to 12 inches. In another series the experimenter told his subjects that the light would move up, in another case that it would move around in circles, and at the University of Michigan they did a study in which they told the subjects the light would form the letters of the alphabet. It formed the letters (some of them were seen backwards) but in general, it succeeded well in doing what the experimenter said it would do. Now, why? Why does an individual see what he is told he will see? Because the frame of reference, which we all use and which is absolutely essential to give meaning to our observations, will be more or less objective if it has a chance to be, but it will be subjective as far as it has to be. Sometimes you can't demonstrate factually that such and such is the case -- which, of course, is the situation with regard to most normative problems, problems of right or wrong, of well-being, of desirable and undesirable social practices. We apply necessarily a frame of reference which is largely given subjectively. You and I witness the same political occurrence and see it with all the objectivity with which we are capable as right or wrong, exactly as the anthropologist tells us that primitive people regard as certain and incontestible many judgments which to the outsider are highly debatable. We supply, in other words, a frame of reference from our own experience and prejudice whenever possible. In other words, our stereotypes arise not only from past empirical evidence but from emotionally toned habits of the individual personality.

I may mention particularly one use which was made of this work on the auto-kinetic effect in studies at Columbia.

A person who had training in optical effects was brought into the laboratory, being informed in advance how to distribute his judgments. He was to make a certain number of judgments of two inches, others of three inches, others of four inches. The light of course never moved. Another subject, quite naive to the task, was told to work independently and not be influenced by the first subject. Nevertheless, within a few calls the second subject was beginning to distribute her judgments throughout the range and with the same average as the first subject, and throughout the period hewed to the line and gave what she thought was an objective record, though actually guided by the judgments of a person whom she respected. She testified she had reached her judgments inde-

pendently and without bias.

Then there are experiments comparing individuals with groups, in which the individual observes alone and in other instances as a member of a group of three or four persons, in every case being told to work "on his own". We find that after the person has three times functioned in a group and then is set free to work alone, he carries over the social stereotype which has been learned in the group and afterwards delivers his judgments autonomously he thinks, but actually as a mere repetition of what was learned in the group.

I am sure you will see here many opportunities for exact laboratory work to throw light on the factors which function in the case of social prejudice of all sorts. I am sure you realize that a great many of our more serious distortions of thinking in the social sphere, social prejudices generally, are instances in which the person having authority such as the parent gives the individual, very early, a frame of reference from which to proceed, the individual ever afterwards quite honestly believing that he has formed an independent judgment and is responding in the light of his own experience.

I may add that a concept borrowed from psychoanalysis which you may recall from earlier discussion in this series is of great importance here. It has turned out in these studies that emotional factors play an extremely important part in setting up the frame of reference. That is to say, the child who first forming a social attitude identifies himself with those who mean the most to him, those particularly whom he deeply loves and trusts, and it is literally impossible for this individual who has modeled his social perceptions upon those of his parents to judge afterwards in terms of independent thought. If we could study more precisely the ways in which these early identification mechanisms work and the way in which social attitudes respond to this mechanism, we might be able by this means to restore to the individual some of that autonomy which he has unfortunately lost.

Now, I know that those who have done some psychological reading will wonder why I did not at the beginning introduce a familiar and important concept used in the objective study of behavior, namely, the conditioned response. The term "conditioned response" is used very broadly in psychology today to define responses which do not occur by original nature, are not given by heredity, but which are derived by virtue of an association, a connection in the light of experience between one stimulating object and another.

We will recall here, for example, the classical experiments of Pavlov in which the dog, having salivated when meat is given him, listens to the sound of the tuning fork presented simultaneously with the feeding, so that after a number of training periods, the tuning fork immediately produces a flow of saliva comparable to that which the meat produced. The dog is said to have established a conditioned response when he sali-

vates as much to the sound of the fork alone as he would to the presentation of the meat.

Now, we are frequently told, do not our social attitudes arise by virtue of conditioning? Are we not as a matter of fact essentially like dogs in the blindness of our early responses and is this not a legitimate way of stating the phenomena which I described to you under the heads of stereotype and frame of reference? Up to a certain point I think the conditioned response will do yeoman service for us.

Suppose we take it in a very simple form as applied to infants. We have the instance worked out by Watson in which the child, who has a positive response to animals, looks at the animal at the very moment when a dismal clang is made. After five joint stimulations, the animal being shown along with the sound of the clang, the child has developed fear of the animal and shows that fear afterwards for a long time; and having developed the fear of a furry animal such as a rabbit or a rat, the child now, as we say, "transfers" this fear to other similar objects, for example, is frightened at a handful of cotton batting or a fur muff.

Isn't it likely now, to be very specific, that racial or national antagonisms arise from specific disagreeable experiences? Is it not possible that a person of another ethnic group has offended us, given us a negative response, and that all subsequent reactions to other members of the group in question are transferred responses similar to the fear of the child for the cotton batting or the fur muff?

Well, at first sight that seems to be an easy and correct interpretation of many social reactions, both prejudices and opinions generally, but let us reserve judgment for a few minutes and see whether that applies to the major data which have not been explained.

We might, for example, turn to a series of research studies dealing with racial attitudes, attitudes of the white man toward the Negro or Oriental, and a certain number of studies of attitudes of individuals of the North European countries towards persons of South European countries, toward Jews, and so on. We have a good deal of evidence that the stereotype takes a great many years to develop fully. The beginning can be noted even in the kindergarten. Some people will tell you that there is no prejudice in little children. That is not true. By the time they reach kindergarten they have begun to make racial distinctions. It is true of all classes and all sections. But there is not very much prejudice in the kindergarten. You can see the thing grow, so that a racial cleavage of some sort has become rather apparent by the eighth grade. We are asked to believe that this is due to the conditioned response.

Suppose we take the case of Horowitz's study in which several groups were compared in their attitudes toward the Negro, -- a group who literally had no contact with Negroes and another group who were playing with them constantly. It was found the groups developed their

prejudice at the same rate and in the same way. As a matter of fact, in Horowitz' study, there was no difference of any great moment between children in the North and in the South, and no difference which could be plainly traced to specific personal contact.

If you would like a very concrete instance, I might mention the case of a fifth grade boy in a New York City school, a colored boy admitted to the class in the middle of the year who, in the course of the year became very popular with the other children, became captain of the basketball team, and so on. At the end of the year this class was tested by Horowitz' test. They showed neither more nor less racial cleavage than other classes, those which had no contact and those which had maximum contact with the other racial group.

There is abundant evidence from studies of this sort that under conditions of social life where stereotypes obtain they control the individual in a most merciless form regardless of his "personal experience".

A similar study was made of Welch children a few years ago in which these children of farmers, miners, etc., were found to have the same general orientation toward Hindus and Chinese that English children had. The stereotype is a matter of our broad culture. It is not a question of personal experience. In other words, if you go back to the conditioned response explanation, if you wish to say that the individual is conditioned and that that explains his social attitudes, I will agree with you if you make two provisos. First, the individual builds up his stereotype not by contact with actual members of a social group, but by contact with the prevailing social norms and stereotypes, and, second, if you admit this, you will agree that in general it takes an enormous amount of conditioning, hammering at the individual year in and year out, to get a stable and clear result.

I think that if those two provisos are made, we shall be able to use the conditioned response interpretation; but I think that I would prefer for purposes of building a scientific social psychology to insist that the concept of the frame of reference is very important even so, because we have seen in the laboratory a great many times that the individual is directly exposed to a situation which "should" make him have this opinion or that, but he never even notices the stimulus. He is never even aware of the fact that you have brought pressure to bear on him which in the case of other individuals would make him free himself of his prejudices. That is to say, the conception of conditioning is only valid when you remember that the individual focuses upon the world in terms of a given frame of reference and unless his frame of reference, his whole mental set is such that he "can be told", the mechanical control of stimuli on the part of the experimenter will not condition him. This then means that we may be grateful to the behaviorist for his emphasis upon this concept, but need to see it in perspective.

Now, I talked a few minutes ago about the mechanism of transfer, which is of very great importance because all the time all of us, the most sophisticated as well as the most naive, judge by analogy and put people in certain broad classifications and give them attributes which they personally don't really have but which supposedly certain members of their group actually have. The concept of transfer or generalization does really apply here particularly in the case of social attitudes.

I am going to illustrate from one particularly narrow case because as before I would rather be concrete than to attempt too much generalization. I want to talk about the development of attitudes toward "out-groups", referring to all those individuals who seem to us not to belong to our own special favored inside group. Now, there is for the measurement of these social attitudes a very simple yardstick known as the Bogardus Social Distance Test. This test has seven steps indicating the degree of closeness to one's self which one would allow typical members of various social groups to assume. This is a questionnaire, the top of which carries these directions: According to my first feeling reactions, I would willingly admit members of those groups circled below to each category which I have marked. And then beneath that set of directions you have a series of seven steps. Column 1 means that you would admit those persons to close kinship by marriage. Column No. 2 means that you would admit those people to your club as personal chums. Three means that you would admit them to your street as neighbors. Four, to your occupation in your country. Five, to citizenship in your country. Six, you would admit them as visitors to your country, and seven, you would not admit them to your country even as visitors.

These indicate seven degrees of social distance or the other way around, social nearness. We presented, following Bogardus' procedure, a list of 21 nations and races, but for certain technical purposes did not include American minority groups about whom rather special problems come up. Broadly the question was the admission of Europeans to the United States and the degree to which these would be allowed membership in our various social classifications. A typical list would start off, for example, Armenians, Belgians, Canadians, Danes, French, Germans, Hungarians. You typically have as many as 50 or 75. We used 21 of these out-groups. We measured the total amount of social distance recorded.

Here we are very often asked the question, do paper and pencil tests really tell you anything? Can people honestly tell you their social reactions on a questionnaire? In answer, we found over and over again that a person although showing a good deal of social distance toward many groups would admit some group that isn't ordinarily allowed to the first category; we would look him up and find that he happened to belong to that particular group. One man had shown about as much hostility to Europeans as any student I ever saw, except that he gave Portuguese class No. 1. He wanted to admit the Portuguese to close kinship. The name didn't mean anything to us; we looked him up and to our surprise

found he was a Portuguese Hawaiian; he was true to his group. Indeed, we have a good deal of evidence that these tests have a pretty high degree of validity, as a matter of fact, we found we could predict to a considerable extent the political behavior of people in later years from a knowledge of their professed opinion.

With regard to the Bogardus test, I was raising the question of whether social attitudes are specific or general, an endlessly debated question. Do you have a number of particular antipathies, are you a person, so to speak, full of antipathies, or do you have broadly generalized antipathies. The results of this test are completely uncanny. I haven't time to give you a complete quantitative result (even though I am not assuming a knowledge of statistical methods) but suppose you should take the internal consistency of the Bogardus test, asking yourself whether the amount of social distance relative to Armenians, Belgians, Canadians and Danes would tell you anything about social distance relative to English, Finns, Germans and Hungarians. No, you would say those attitudes are specific. I say no. Well, suppose you, as a good sport, pick me up on this. Would anybody who is familiar with statistical procedure tell me what the correlation would be between odd items and even items on the test? Suppose I give the total "distance" for the eleven nations and races and have ten left over, how much social distance will I find on the remaining ten if I know the first eleven? In terms of correlation would anybody like to guess what that relation would be? A standard method of the statistician, the Pearson product-moment correlation, gives a score of 1.00 to an absolute identity of variation in two measured variables. In other words; if the very same factors which made you want Germans and Finns kept out also made you keep Greeks and Hungarians out of the United States, then the correlation figure would 1.00. Actually the figure was .95.

In other words, if you drew out of a hat 11 of these groups and if you told me how you feel towards those 11 groups, I would predict with no risk at all, up to the limits set by a correlation of about .95, how much social distance you would show toward the next 10 groups even though you don't know what they will be. In other words, social attitudes of this sort are very highly generalized. It is not at all correct to say that a person dislikes Greeks because he had an argument with a bootblack. The chances are he rationalized that by picking upon a specific incident. He could think of at least 20 incidents. That is to say, the social stereotype, which I am illustrating here from the case of race attitudes but which applies to things generally, is a broad orientation toward life, it is probably picked up very early. Our evidence seems to be in the case of students, that parents and reading matter are the two most important things, more important than neighbors, infinitely more important than the movies or the radio or even than the press. The primacy of the home is challenged during adolescence by reading matter. Books are the only influence up to 15 or 16 years of age which seriously compete; but books give a diffuse general orientation, not a specific set of attitudes only.

Suppose anyone were so foolhardy as to undertake the measurement of general radicalism or conservatism -- Gilbert's adage that "every boy and every girl that's born into this world alive is either a little liberal or else a little conservative." The question is whether the thing pervades all attitudes.

Are you radical on racial matters, then will you be so on religious matters? How broad is the attitude? We found that after we had constructed a measure of general radicalism, this single test which I have described, this Bogardus test correlated .60 (the maximum possible is 1.00) with that general measure, indicating that what one might call the acceptance of minority groups, the acceptance of out-groups other than one's own, is a very important aspect of the general orientation which we call radical. We have evidence of certain other broad general pervasive factors, much more important than narrow or specific factors involved in this or that personal contact.

This seems to suggest that we should look not for narrow conditions but for the frame of reference as a preliminary prior to conditioning, and we should look to the whole cultural pattern of American society rather than narrow and specific environmental effects, for the interpretation of most social attitudes.

There is one more thing that I want to say about conditioning which comes to us very recently from Dr. Gregory Razran of Columbia, along a line quite unexpected and most surprising. A year ago I should never have dreamed that this concept could be used in the way he has used it. Again I will show how I was the goat in an experiment mistaken as to what was happening.

Razran had discovered among a group of college students that the preferences for music, literature, art, and so on, were very profoundly affected by apparently local, special, adventitious circumstances. He found, for example, that if you played music to the student while he was eating his lunch, he showed a very marked change in attitude toward that music afterwards, even if he didn't know that the food was related to the music. Having worked this out in preliminary terms, Razran asked me to allow him the use of some of my classes to go further with this. So a group of students was taken over to the grill and given a pretty good lunch; standard recorded music was played before, during and after the meal. This music had been prepared in collaboration with experts in the field of music in terms of paired disks; in each case the subject had to tell you which of two selections he liked better. Actually, the music was pretty complicated and many acted as if they were a little more interested in the conversation and the meal than in remembering the details of the music they had heard. After we had given a large number of judgments as to which piece of music we liked better and had given our reasons, telling why we thought A was a better piece of music than B, the data were carefully analyzed. They showed very clearly that many pieces of music which had been unfavorably judged

before lunch were favorably judged later if they had been presented along with food, and that many pieces of music which were favorably judged at first but which had not been played over during the meal had tended to lose their value. The individual proceeded, however, in most cases to give a "good reason" for his choices. I noticed, for example -- and here I was the goat fully as much as anybody -- that one piece which I heard after the whole thing was nearly over, at the very end, was a very strong, vigorous "masculine" sort of thing; it was almost martial music. I referred to it as having "rugged strength". Well, actually I had defined the same piece of music previously as "insipid" and "formless". Almost everybody showed that his attitudes are subject to conditioning but the person himself can't tell you why he feels as he does. And of course musicians though their responses are less naive are people just the same. This experiment is now being repeated with fine arts reproductions, and with similar results. I do not say that factors of artistic excellence are immaterial. I do not say that the artist moves on his stomach. I do say that we are profoundly affected in all sorts of attitudes by very simple things, the effectiveness of which we don't realize.

Now, says Razran, how about applying the conditioned response theory? This seems to be an obvious necessity. But everybody that has ever experimented on the conditioned response knows that the responses will die out in time if you give them a chance and don't constantly re-enforce them; and Razran finds that if these attitudes are created and then are let alone, they die out. But is that characteristic of social attitudes? Aren't they deep-seated and ingrained? Yes, and that is exactly the point. After you have collected your preferences, you must demand the rationalizations, because it is by verbalizing and integrating the attitude with the self, -- "this is my attitude, this is what I believe," making it a matter of principle, that you reach a "reason" for your opinion, see the thing coherently. It is then that the thing sticks. Social attitudes are "formed by conditioning", if you include the fact that the conditioning is effective permanently only when the person verbalizes, integrates, makes sense, justifies morally the attitude which he has. And of course that is exactly what we do all the time. If not the parents, then the playmates; if not the playmates, then adult propagandists, enable the child to fixate and to find good reasons, acceptable, socially passable reasons for those attitudes which are in large part blindly assumed. Razran's data do show the importance of conditioning but they show it is conditioning of a complex sort subject to all sorts of controlling factors.

Now, I have just mentioned the case of the propagandist. Does the propagandist in controlling social attitudes do anything more than what I have already described? Yes, he does. In the first place the propagandist has planned in advance the way in which attitudes are to be changed and he has studied the psychology of emotion. He knows how to hammer away until the task is done. It was not by accident that the Hitler voice was used on phonograph discs week after week before the

actual vote setting up the regime. He has a kind of repetition at his command which the every-day teacher does not always have. Second, and more important, the propagandist is nearly always able to state an issue in such a way that the negative has no chance to be registered. We did, for example, a propaganda study of this sort early in the days of the Manchurian crisis, in early 1932. We had a student who was particularly interested in seeing how quickly students' attitudes could be altered on controversial international problems. We made up a series of attitude propositions in collaboration with Japanese and Chinese students, and we used Japanese and Chinese propaganda and neutral material from the Foreign Policy Association relating to the Manchurian issue. My friend, George Vetter, used pro-Japanese propaganda at New York University and I used pro-Chinese in Columbia classes. We produced an incredibly big shift in attitude, much bigger than you'd think, many students almost getting up bag and baggage and moving across the stage to the other position. It wasn't fair to leave it this way; we had to reverse roles, so we did so. Classes took their bag and baggage and "walked back".

If we think that adults, even the supposedly sophisticated student, can't be influenced by propaganda, you get some big surprises. But the question is how and why, what is the best technique? One thing is simply studying the "silences", simply knowing exactly how to keep quiet. For instance, the Japanese propaganda in the case cited, related to Japanese investments in Manchuria. Every word of it was correct. The Chinese propaganda related almost exclusively to Chinese investments in Manchuria. Every word of it was correct. As far as I know there wasn't a word of falsehood present, but they were both eloquently silent with reference to anything which might disturb the attitude, and they produced the effect.

The propagandist (like the advertiser) is able to phrase his case in such a way, that opposing influences which would occur in most life contacts don't come in. Life contacts give a better break, so to speak, to the critical intelligence than propaganda does.

A second factor in which propaganda differs from ordinary indoctrination is in the prestige of those administering it. Just as any soap or cosmetic is much better if Queen Marie uses it, so any political idea is very much better if it is tied to some outstanding and honored name. There has been a great deal of work done on that, too. If you want to find out how many experimental sessions it takes you to put over a piece of propaganda, by and large, I would guess that ten half-hour periods given anonymously might give the same result as three half-hour periods of the same material attributed to some great statesman. Of course, when used in the classroom you have to be honest with your students afterwards, but the propagandist doesn't always have to be. Convey the idea of unlimited prestige back of the idea; there is no escape. The propagandist is able to create rather easily what Floyd Allport called the "illusion of universality", partly by means of the two methods I have described. The parent can seldom do that. The parent, in a homogeneous culture area where everybody thinks the same, cannot

permanently immunize the child against disturbing cross currents of thought. The propagandist can convey the impression that every person is thinking and doing so and so, and can do this much more effectively than the home or the school. All this means that propaganda is one of the most serious of social instruments which a free people must investigate. It means that it isn't sufficient to find out that individual homes or schools or playmates produce stereotypes which may distort the thinking of individuals, one must but carry out a sustained and serious scientific study of what propaganda is and how it works.

These few superficial things can be said in a few words. Actually the art is complex and many critical points which are of importance for Americans to understand in the next 25 years have not as yet been investigated with sufficient thoroughness to permit any conclusion as to what propaganda is doing and as to how its effects can be counteracted.

Although, in general, science is supposed to be completely impartial and not to deal with controversial questions, there are certain scientific and factual questions which the social psychologist has no right to run away from. For example, in a democracy it is an important thing that scientists should investigate the formation of norms and should understand the factors which cause individuals to accept or reject those norms.

I might put the question in this way: At least from the time of Jefferson we have all assumed that public opinion is a reflection of public interest. We have assumed that if the mass of the people say they want something, then the mass of the people want that thing. We have assumed that there is a direct barometric relation between people's needs and what they clamor for. Sometimes we have doubts. Certainly the advertiser who has to put his dollars and cents into this has serious doubts; certainly the practical man dealing with politics has even more serious doubts; and the political scientist and the social psychologist are prepared to debate this generalization from start to finish. That is to say, the study of human wants, the study of human reasoning processes, and the study of public opinion require three levels of analysis. We have no right to assume that the voice of the people, public opinion broadly, is in any sense a direct reflection of people's needs. It may prove to be in certain cases, but that requires research. Certainly in many cases one has a right to raise a question. Suppose one inquires in general as to the relation in the American scene between the economic distress of individuals and the urgency of their desire for change. If public opinion were the simple thing that it is ordinarily supposed to be, the urgency of protest should be directly related to economic adversities, but it isn't. On the basis of a great deal of research work, it has become clear that in a great many instances the people who are the most miserable are the most conservative. The people who are relatively well off make up a rather large proportion of those who are most deeply unhappy with present social arrangements. It turns out that the individuals who have the most deep seated convictions

regarding where their interests lie have very limited understanding of the economic situation, or broadly of the social world, and the degree and way in which it might possibly be altered. It turns out, in other words, under such investigations, that one has to study a series of processes which intervene between what you might call one's economic plight and one's political creed. That series is partly a psychological series.

One of the three broad reasons I think why this problem exists and why there is such a very loose relation between the economic situation and social demand is a phenomenon which the sociologists call cultural lag. They point out that there is often a very long interval between the need for a social change and the first mechanism to fulfill it. For example, there are reports indicating at least 40 years between need for conservation of forests and the actual large scale work which followed upon the recognition of that need. Certainly many illustrations will occur to you of great cultural lag.

If you look at the Lynds' book, Middletown in Transition, you will be impressed by the fact that this little city in the Middlewest has moved from essentially a one class town, where everybody knew everybody else and accepted everybody else as a social equal, through a period of being a two class town, where there was a business class and a working class with a rather definite distinction, into a period of being a three class town, with top, bottom and middle strata. Why shouldn't there be a cultural lag if people who formed their attitudes before they were 20, now after pretty nearly 50 years, still carry some of the old pioneer attitudes? Why shouldn't there be a discrepancy between the present economic basis and the psychological basis? "Public opinion" may reflect response to a set of arrangements which obtained at a formative period in the individual's history and not be realistically related to the present plight of the person.

The second difficulty that I would like to stress which makes public opinion by no means predictable is what I should like to call the permeability of class lines. It is certainly evident that the class structure in the United States is not similar to what it is in Great Britain or anywhere else in the world. There is much more vertical mobility, much more confusion of one's class, much more uncertainty where one belongs and a great deal more confusion of ideas up and down. Of course the ideas tend to percolate down rather than up, particularly with large scale control of the national radio hookups, the press and other means of communication. That is, it is perfectly evident that in many instances at least, individuals may take on the attitudes of those who belong at a social level economically much higher than their own. This is another way in which the individual attitudes do not reflect one's own economic plight but rather the broad outlook which is necessarily conveyed by those who own and control the means of communication. In other words, there is not only an economic but a psychological reason for studying the discrepancies which exist between personal wants

and needs and the factors in livelihood which lie behind.

Now, from this point on, I think we leave the scientific field as such and go off into a normative question on which I would rather not spend time. But I want to stress that the psychologist can no longer maintain his isolation in his ivory tower, studying the color zones of the retina and the spinal reflexes of the frog. He has got to study the interrelations of persons and of individuals' hates, prejudices, and ideals. It seems to me that in a democracy one of the most important problems of a social psychologist is the study of social attitudes, the way in which they grow, the factors which control them and the degree to which they actually serve the best interests of individuals and communities. If democracy is going to work, it can in the long run only do so if it is founded upon a sound, broadly conceived and wisely interpreted knowledge of human nature.

Human nature, as seen both in the laboratory and in life's every day problems, sets for us the stage for experiment, and experimental results point the way back again to the study of social issues.

Lecture VII

THE PSYCHOBIOLOGY OF THE GREAT APES
(Illustrated by lantern slides)

Robert M. Yerkes

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THE PSYCHOBIOLOGY OF THE GREAT APES
(Illustrated by lantern slides)

by
Robert M. Yerkes

Doctor Kaufman's last statement makes it seem as though I had not yet arrived at man, having thus far progressed only from dancing mouse to chimpanzee. My own feeling about the matter is somewhat different, for beginning my examination at both ends of the series I have in the course of my years of research gained more insight, I suspect, from the infrahuman primates, and especially the chimpanzee, than from my fellow-men.

Any of you who may question the desirability as well as the necessity of using other organisms than ourselves for the study of mental life should consider that there are varied directions in which we either are not available for experimental inquiry or are highly unsuitable as subjects. It is for this reason, among many, that we use various types of animal in psychobiological research. Indeed, there are a great many problems for the solution of which we must depend wholly upon the assistance of other organisms than ourselves.

So much by way of apology for the subject of this lecture.

I purpose now to exhibit the skeleton of my talk instead of trying to conceal it. In the first half of the time which you will allow me, I shall try to sketch the psychobiology of the chimpanzee by describing briefly certain conspicuous features and characteristics. Thereupon I shall illustrate and supplement my oral description with a series of lantern slides selected from the collection of our Yale Laboratories of Primate Biology. I must ask you not to overlook the fact that in the limited time at my disposal I shall have to be somewhat careless of transitions in order to make much headway.

Turning now to our synoptic sketch of chimpanzee psychobiological traits, I shall present my description in terms of five principal behavior and experience categories. For in a chimpanzee, as in ourselves, it is legitimate to speak of experience. In fact, I know the experience of the chimpanzee by inference just as I know your experience; the only radical difference is in mode of intercommunication, for the ape does not tell me verbally about its experience or about any other aspect of life processes.

The first of the five categories which I shall use descriptively is that of the senses and perceptual processes, which as you know determine the environmental contacts, relations, and, in part also, adjustments of the animal. The second category is that of memory and imagination, which, by the way, together constitute the primary basis of useful knowledge in chimpanzee as in man. Third is the category of behavioral adaptivity

and learning; fourth, that of expressivity and emotional experience; and fifth, that of social behavior and relations.

Of course only a few minutes may be given to each of these several categories. If I could show the illustrative slides immediately in connection with my verbal description the effect might be somewhat heightened, but I must ask that you permit me to postpone the slides until later to conserve time.

Considering our first category, sensory and perceptual characteristics, we proceed from familiarity with the so-called special senses or sense modes of man, for the sense modes, instead of being limited to our five special senses, comprehend many others. So far as we know at present, this is true also of the chimpanzee. Our investigations have revealed no essential or fundamental difference in sensory capacity between ape and man. Apparently they possess all of our varieties of sense, and the order of acuity, so far as revealed by present measurements, closely approximates our own, although sometimes greater, sometimes less. Individual differences are conspicuous. So, too, the range of sensitivity in the modes thoroughly studied is roughly comparable to that in man. Our knowledge of chimpanzee senses is meager, and it may well be that further study will reveal important characteristics which are peculiar to the chimpanzee. Sight stands out as conspicuously important. Hearing also is demonstrably important. The chemical senses of taste and smell seem to play about as significant a role in the apes as in us. So the only really significant statement to be made is that these creatures appear to be as well equipped in sensory capacity as is man.

When we examine the perceptual processes we immediately discover differences which cannot be briefly and adequately described. I may give you an inkling of the sort of thing which is in point by saying that chimpanzees are much more narrowly bound by spatial, temporal, and other types of relational form than are we. Of course all perceptual processes are more or less completely matters of individual acquisition; that is, we and they learn to see or to hear things in certain definite ways. The modes of space perception, for example, although largely acquired during individual life are also highly modifiable. But in the chimpanzee there is this peculiar difference from us: they are just as much at home and as comfortable in one bodily posture or attitude as another. Standing erect is not necessary for their interpretation of their spatial world and its varying relations. To illustrate: a few days ago while I was measuring the coat and skin characters of a mature animal, she chose to stand on her head instead of her feet. They are highly arboreal by nature and accustomed to respond to environmental situations from a great variety of bodily positions. The way the world looks to an animal visually and the way it must be adjusted to depend upon the type or types of visual perception. The fact that the ape can climb expertly and may rest or work in almost any bodily position is highly significant in its relation to the nature of space perception.

I see that I am giving relatively too much time to the consideration of perception, and the transition must instantly be made to memory and imagination. Here also similarities first impress us, but in emphasizing them I should not wish to give the impression that they are more important than the ways in which chimpanzee memory and imagination differ from the human. The animals have a memory span which in many instances compares favorably with ours. They may for example remember a person not merely for days or weeks but for months or years just as we do. So likewise with happenings which affect their later behavior and the objects in their environment if they are of first-rate importance. Indeed, anything which makes a sufficiently vivid impression on the ape may bring about an organic change which persists indefinitely and may at any time show itself in the behavior of the individual.

It seems that basically the memory equipment of the chimpanzee is very like our own, but there is this radical difference among other important ones: the apes lack ability to use symbols, and when I introduce the term "symbol" without definition I point especially to visual and auditory impressions or images. The behavior of the chimpanzee makes quite clear to us their lack of such varied and flexible symbols as we use to label or designate varieties of experience. Yet it is equally clear that for the chimpanzee out of sight is not necessarily out of mind. Constantly things are done by it on the basis of previous experience and more or less irrespective of the interval of time which has elapsed. In chimpanzee life there seems to be a peculiar difficulty in adjusting to free or floating stimulus qualities, and if you dissociate color from the object or place to which it would ordinarily be attached, the animal may be utterly at sea. In fact, generally speaking, it is next to impossible for an infrahuman primate to respond appropriately to non-spatial visual sense qualities.

The ability to acquire habits and thus adapt to the usual conditions of life or to solve unusual problems manifests itself in several forms. What is known as the process of trial and error frequently appears just as in us. But there is also evidence that the chimpanzee really sees through or understands many of the situations which it has to meet, again, perhaps, somewhat as we do. So, although trial and error constitutes one of its major modes of adaptation, the chimpanzee certainly exhibits higher or more complicated varieties of learning, in which undoubtedly it is greatly aided by its insatiable curiosity. The apes seem to be interested in everything, tend to investigate everything, and to take things apart! Sometimes this looks to us like wanton destructiveness. Also they are suggestible and imitative in a degree which markedly affects the acquisition of habits. With sufficiently strong curiosity and suggestibility, an animal may go a long way toward behavioral adaptation which looks intelligent or which actually may be intelligent.

Of their own initiative and without aid from us, chimpanzees discover, devise, or invent new things to do, new ways of occupying themselves in captivity, among them novel modes of play. A considerable

degree of inventiveness is exhibited in daily life if the conditions of captivity afford opportunity for invention. When confined in a bare cage where there is nothing to do but eat and sleep, mechanical manipulation and other than behavioral inventions are out of the question.

By varied experiments the existence or near-approach in these animals to what we recognize as insightful behavior has been demonstrated. The usual procedure is to devise some type of problem which can be solved only on the basis of what we term "insight", understanding, or perception of relations. Many such problems, including the series of box-stacking tests, the box and pole test, and the multiple choice, have been used more or less extensively. Some of us feel that the chimpanzee occasionally in such problem situations manifests insight; others who are perhaps more skeptical -- or is it more polite to say critical? -- doubt that the behavior is really insightful. Perhaps our safest recourse in this situation is to say that insight exists in varying degrees and possibly also varying forms or types, and that even if the chimpanzee does not manifest our particular sorts of understanding it has something of its own which serves a purpose similar to ours.

As to behavioral expressivity and emotional experience, the chimpanzee certainly approaches us much more nearly than does any other existing animal. This is true of variety as well as range of emotional expression. In general, this ape is far more expressive than the other two types of great ape, the orang-outan and gorilla.

Infant chimpanzees, like human babies, not infrequently use emotional expression for practical purposes. They cry when they want something, make themselves disagreeable to their parents or elders, and, if necessary, go into a temper tantrum. The latter, I assure you, cannot be taken lightly or humorously. It looks too serious. Yet it is delightfully amusing to see a baby chimpanzee in the throes of one of these spells of tossing itself about on the floor, screaming, tearing at its hair, scratching or beating itself, look slyly at you out of the corner of its eye to see what effect its behavior is having. I have several times observed this. Obviously the behavior is a show for effect. The only reason for it as a display is the infant's desire or need of something which mother or human attendant can supply.

I have said that the range of emotion approximates our own. Among the common forms of expression are bodily posture, attitude, gesture, facial grimaces, sounds. Although the chimpanzee does not speak in the sense of using a system of vocal symbols linguistically, it produces a considerable number of meaningful sounds. Taken together, the various modes of expression constitute what may be spoken of as language. Intercommunication is highly developed, but more often it occurs without sound production. For this reason it is misleading to think of the animals as speaking to one another.

Sympathy, appreciation, and like emotional attitudes toward per-

sons are commonly expressed. Once you win the confidence and a measure of attachment or affection of an individual, you may do almost anything for or with it. This has obvious and far-reaching importance for our experimental uses of these animals. More commonly than not we rely upon their trust in us and their partial understanding of our desires than upon any form of coercion. Indeed, the practical outcome of our discovery that confidence is the key to cooperative relationship is rapidly increasing dependence in our laboratory use of the animals upon their voluntary cooperation in all sorts of situations. This applies to the disagreeable or even painful manipulative procedures as well as to those which may be thought pleasant. Everything, it appears, turns on the degree to which you can command the trust of the individual. Animal types of which this is true are very rare. Even in case of the most intelligent of the monkeys, it is difficult to train one to the point at which you can submit it to experimental practices with its voluntary cooperation.

Finally, with respect to social behavior and relations, the chimpanzee baby comes into the world absolutely dependent. For weeks it clings to its mother the greater part of the time. Locomotor independence is gradually achieved between the fourth and sixth months ordinarily, and not later than six months of age the animal should be walking. Thereafter it rapidly becomes increasingly independent of the mother, and by three years of age it may be highly self-dependent. But then it faces demand for a new type of behavioral adaptation; namely, fitting itself into the species hierarchy of dominance and subordination. For every chimpanzee has its own social station or rank, its dominance order, which is determined by its age, strength, aggressiveness, determination, intelligence, or perhaps one might include everything in the term "personality". The dominance-subordination order is the governmental structure of chimpanzee life. One cannot exist in their society without being dominant over certain fellow-apes, subordinate to others. It is a shifting relationship, of the utmost importance, and entirely unescapable unless the individual lives in complete isolation. The dominant individual naturally has very definite and important privileges, but it has also extremely important obligations to the social group. I might very well spend the remainder of our hour telling you about the forms and expressions of social relationship in our interesting fellow-primate, the chimpanzee. The story has a great many practically and theoretically significant lessons for us.

One of the best examples of complicated social behavior in the chimpanzee is known as grooming. You as a visitor to the zoological garden may know it as flea-picking. Sometimes, although rarely, it is precisely that. But more often it is a type of mutual social service which ranges from toilet-making or assistance in that process to what approximates medical and surgical services in case of injuries or illnesses. There are many essential or desirable things for the maintenance of cleanliness and comfort which the chimpanzee cannot well do for itself. These are customarily looked after by companion apes. If you observe the process of grooming in any chimpanzee group, you will shortly be convinced

that it is a rather complicated and also an extraordinarily important variety of activity, which not only has social service values, but frequently suggests the altruistic. The behavior rarely occurs in young specimens and is most common in adults. It may occur between individuals of like sex or between males and females, and it is by all odds one of the most interesting types of social expression known in the infrehuman primates.

A few minutes ago I referred to cooperation as something which we expect of our chimpanzee subjects. Actually we have come to expect and require it almost without limit. For it seems that the more we consider them capable of doing for us, the more we ask of them by way of adaptation to experimental requirements, the more we get in return. They do not, it is true, naturally cooperate to any considerable extent with one another in the solving of novel problems, but just the opposite is true with respect to our relations to them and their general adaptation to the conditions of psychobiological experimentation. I wish to illustrate this by citing two instances from our laboratory experience.

A well-grown male, in use in our New Haven laboratories, after a serious illness seemed to have difficulty in eating solid foods. A staff member entered the animal's room to examine his mouth, for we suspected that there might be something wrong with teeth or gums. The animal assisted by opening his mouth, and the examiner, after a thorough inspection, decided that there was no adequate explanation of his behavior apparent. He therefore turned to leave the room. The animal, however, reached out and plucking his sleeve drew him back. At the same time he opened his mouth and with one of his fingers pointed to a place in the upper jaw. Accepting this as explicit direction, the examiner explored further and discovered a spot whose condition suggested the eruption of a tooth. A subsequent dental examination confirmed this suspicion. Presumably there was sufficient discomfort in the jaw to render the animal sensitive to hard foods. Asking the examiner to look at the right spot certainly was significant. I cite it as cooperation.

One of our young chimpanzees in the Florida laboratories developed a felon on a finger, which became so sore that it was decided to lance and clean it. To make sure that the bone was not affected, a physician undertook the task. He was strange to the animal, and it was therefore assumed that we would have to hold the patient during the minor operation. When brought into the operating room the little fellow surprised us by sitting quietly beside the man who had carried him in and permitting the doctor to come up and carefully examine the finger. Without restraint or alarm the chimpanzee allowed the examination to be completed, the felon to be opened with a scalpel, and the finger manipulated and cleaned. All the while the patient watched the procedure closely as if interested and at the same time confident that the proper thing was being done for him.

Not until the doctor cut through a bit of live flesh did the animal even flinch, and even then he made no effort to withdraw. The

wound was completely cleansed and dressed, with as perfect cooperation on the part of the chimpanzee as a human patient could have offered.

If I may now borrow your eyes as well as your ears, I should like to continue and conclude this exposition by presenting slides to illustrate the materials of observation, the methods and results, of which I have briefly spoken.

Thereupon the lecturer, with appropriate descriptive and explanatory statement, exhibited the following five groups of slides.

Group 1, seven slides, representative of the chimpanzee from infancy to maturity and a chimpanzee family in the Yale Laboratories at Orange Park, Florida.

Group 2, nine slides, to represent experimental apparatus, methods of inquiry, and results of studies of sensory capacity and perceptual characteristics of the chimpanzee. The group included pictures of the Elder auditory apparatus, the Forster reaction-time apparatus, and the Spragg anticipatory-response apparatus.

Group 3 comprised four slides bearing upon studies of memory, imagination, and habit formation.

Group 4 related to expressivity and emotional experience in the chimpanzee. It consisted of five slides which presented various emotional and linguistic expressions, and, in addition, the Haslerud apparatus for the experimental study of avoidance or fear reactions and of experimental frustration and the production of transient behavioral disturbances.

Group 5 included eight slides, relative especially to forms of cooperative behavior exhibited by the chimpanzee, the grooming process as social service activity, and apparatus and methods for the study of such phenomena. The Kohler box-stacking method, the Crawford apparatus for the study of cooperative effort, and the operative procedure of Spragg and Bruhn in making hypodermic injections and taking blood samples with the cooperation of the chimpanzee, were represented.

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Lecture VIII

PSYCHOLOGY APPLIED:
WHAT WE SHOULD KNOW ABOUT HUMAN NATURE

Daniel Starch

PSYCHOLOGY APPLIED:
WHAT WE SHOULD KNOW ABOUT HUMAN NATURE
by
Daniel Starch

I do not like superlatives because they are apt to be either untrue or so self-evident that, to borrow a phrase from William James, they are merely the unprofitable delineation of the obvious. Nevertheless, at the risk of both exaggeration and obviousness, I am going to venture the following statement. The greatest need today is better understanding of human nature and a determined effort to use that understanding. That is my thesis and, therefore, I want to repeat it. The greatest need today is better understanding of human nature and a determined effort to use that understanding.

Now, if you think that is too superlative a statement, I am going to qualify it and say that one of the greatest needs is better understanding of human nature, and a determined effort to use that understanding.

This I believe to be true in business, in government, and in daily living. I am literally amazed almost every day at the utter lack of understanding of human nature and human problems, not only in lowly places but in high quarters, in business, in public affairs and in daily family living. If you have any doubt about the importance of human problems and the understanding of human nature and its place in life, let me suggest this to you:

So far as you yourself personally are concerned, I suggest that you keep a detailed record for one week of your own activities and dealings with people and at the end of that time analyze it.

So far as other people are concerned, particularly business men, take such time as you can during the course of a week and talk with them, with executives in government and elsewhere, and find out what their problems are, what their difficult situations are. Make a record of them and then analyze them at the end of that time as carefully and as accurately as you know how. I venture to say that you will find in both cases that the most serious problems have to do with human situations and relationships, and that effective methods of treating with these situations rest upon understanding human nature.

I could cite many concrete examples of the truth of this assertion. Let me cite just two or three illustrations.

A certain company has subsidiaries in various parts of the country. A new manager had been appointed for one of these subsidiaries. He was much concerned about his authority and prestige. His superior, the division manager, was a man who disliked advice, much less orders from his superiors, but he did not want his own subordinates to exercise individual judgment. However, the new manager issued a letter asking his

department heads to come together on a certain evening so that he might present to them plans for developing business for his company. A copy of this letter came in the ordinary course of business across the desk of his superior, the division manager. He immediately drove to the office of the manager some two hours away by automobile. The conversation that ensued was about as follows:

Division Manager: Who got out this letter?

Manager: Mr. X wrote it for me but it is my letter and I signed it.

Division Manager: Call the meeting off. There isn't going to be any.

Manager: Well, but this is the first order I have issued to my employees. It will put me in a bad spot if I have to call it off.

Division Manager: There isn't going to be any meeting.

Manager: But if I have to call it off it will hurt my prestige with my subordinates.

Division Manager: You haven't any prestige. I want you to call off the meeting.

The meeting was called off. Now, the question is what are the elements in this situation. What if anything should the top management have done about it? The two men concerned were not boys but men with upwards of 20 to 25 years of experience and their salaries were upwards of \$10,000. I wish to emphasize that this case is wholly a case of human behavior. What elements, motives and reactions are involved? How should they be dealt with? Apparently many persons feel and think, if they think about such problems at all, that the best policy in dealing with human beings is to follow the advice regarding marriage, namely, get them early, treat them rough, and tell them nothing.

Another illustration. The head of an engineering firm was dealing with one of his important associates. He had occasion to criticize his associate and so "called him down" in very severe language in the presence of his other associates and subordinates. The head of the organization apparently never thought of the effect of this on the other person, on subordinates and other associates, and the defacement of his personality.

I can cite numerous instances of persons who know their business, their accounting, their engineering, the physical operations of their business perfectly, but who never give a single thought to the human elements that enter into their business and their operations.

Now, the question I want to turn to very briefly is, as an ordinary

mortal living in a world of people, what should you know about the nature of men and women?

When I was invited to speak on this subject, I made a list of items you should know about human nature. Then I became curious and wondered how other psychologists would answer this question. So I addressed a letter to 81 psychologists including the 31 living past presidents of the American Psychological Association and about ten others of equal standing and experience. The remaining 40 were younger psychologists with a dozen or more years of scientific and academic work in the subject.

In my letter I asked them this question: Considering our general environment, that is, living and working with people, and considering one's own happiness, what are the most essential things to know about human nature, about people?

Sixty-seven of the 81 psychologists replied, including 26 of the 31 presidents. Here are the results. They are very interesting. The most important phase of human nature that you should know about according to these 67 psychologists is motivation. Some of them designated it self-interest. Motivation was mentioned by 46 of the 67 psychologists. It is outstanding above all the other aspects of man's nature. The second most important subject was emotions. This, however, was mentioned by 19, a considerably smaller number than the 46. The third subject was learning and habit formation, mentioned by 18. The fourth aspect was personality mentioned by 17. The fifth was thinking, including imagination and reasoning, mentioned by 10 psychologists. The rest of the subjects I will not mention because they are scattered over quite a range but these five are the most frequently mentioned subjects that you should know about.

The interesting thing to me is that this is a different emphasis from that which is usually placed so far as my observation goes, in the teaching of psychology. These subjects are treated far more briefly than many other subjects which the 67 psychologists mentioned quite infrequently. Only fourteen subjects including the five listed above were mentioned by as many as three or more of the 67 psychologists.

Another interesting aspect of these replies was that four of the men expressed doubt as to whether psychology today had anything to offer about human nature that would be of practical value in daily affairs. All four were past presidents of the American Psychological Association. For example, one of them said, "I do not know anything about applied psychology." Another one wrote, "The question is so general that I should not try to lecture on it and I doubt whether I could give you any useful advice." The third one stated, "I cannot say what is the knowledge about human nature that is most conducive to success in family life. I simply cannot answer the question in general and I do not believe I could give any very definite answer to a particular aspect of the question."

The fourth one said, "There is almost nothing that the academic psychologist knows about human nature which is of any value to anyone else to know."

Nevertheless, I believe that the consensus of the answers secured from 67 psychologists is a correct evaluation of the relative importance of the various aspects of human nature that one should know about in meeting and dealing with the everyday affairs of business and life. This consensus of judgments well illustrates Tallyrand's remark that there is one person who knows more than anybody and that is everybody.

Now, let us approach our question analytically. Let us assume that the common objective of all persons is to be successful in their occupation, to get on with others and to be happy. It is my firm conviction that one of the two or three most important ingredients is knowledge and skill in dealing with people. This is true not only in the continuous daily stream of living but especially so in the world of business where success or failure depends so largely on dealing with and influencing people.

John D. Rockefeller, referring to the ability to deal with people, is reported to have said, I will pay more for that ability than for any other under the sun. And the canny Scot, Andrew Carnegie, selected Charles S. Schwab because of his unusual skill in dealing with people.

If you do not like reference to the economic royalist let me turn to philosophers and poets. Take the Sermon on the Mount. It contains the most precious piece of wisdom uttered by the most influential person in all history. I refer to the Golden Rule. It tells you how to deal with people. The same formula in different words was expressed by Aristotle three hundred years before Jesus, and by Confucius five hundred years before Jesus.

In 1937 I asked one hundred distinguished persons to select for me the one hundred greatest personages in all history. Among the one hundred men who made the selection for me were very distinguished scientists, historians, economists, and philosophers. It is interesting to note that three of the eight personages at the top of the list were concerned primarily in human conduct, in how to live and deal with people. The first eight men at the top of this list of one hundred greatest personages were Jesus, Shakespere, Aristotle, Confucius, Darwin, Lincoln, Plato and Buddha. As you will note, three of these were teachers who taught men how to deal with men, namely, Buddha, Confucius and Jesus. Two others, Aristotle and Plato, were also teachers and philosophers whose influence has lasted down through the ages and much of their teaching had to do with human behavior. One other, Shakespere, had a most penetrating insight into human nature. Lincoln was a leader of men such as is rarely found in all history about whom Stanton, his Secretary of War, said as he lay dying, "There lies the most perfect ruler of men that the world has ever seen." This leaves only one of the eight greatest

personages whose work was not importantly concerned with understanding human nature or influencing it, namely, Charles Darwin.

Now, let us specifically ask what should we know about human nature? I am going to be very simple and concrete and, since this meeting is held under the auspices of the Department of Agriculture, I ought to make some reference to farm life, and to show how simply I want to approach this question. Let me recall that up in Wisconsin where I grew up on a farm they used to tell the story that a farmer had lost his mule. He sent the hired hand out to find the mule but he did not succeed. The neighbor's half-wit boy was standing nearby and heard the conversation. He offered to go and look for the mule. The farmer agreed. The boy went out to look for the mule and came back with him in a short time. The farmer was surprised and asked the boy, "How did you find the mule so quickly?" The boy said, "Well, I just thought for a moment where would I go if I were a mule."

The important thing then, according to the judgment of the group of psychologists, is, to know motivation of human actions, the springs of action, the reins to be used and how to use them. These reins are tied to three fundamental facts about human nature. I shall call them principles or laws.

The first one I shall call the law of ego-centrism, namely, each person is for himself the center of his world of experience.

The second I shall call the law of self-service or self-interest, namely, all actions even though stimulated from without are driven from within and designed to serve the individual.

The third I shall call the law of induction, namely, behavior may be induced in others by appropriate behavior on your part.

If these statements are so obvious that they do not need stating, so much the better but I am sure that their obviousness is matched only by disregard of them. Let me illustrate each one.

First, ego-centrism: each person regards himself as the center of his world of experience. When you read the newspaper, the most arresting word is your own name. When you listen to conversation, the word most certain to catch your ear is your own name. I recently looked up the frequency of the use of the word "I" and "my" and "mine" as compared with other words. As you know, many studies have been made in the last twenty years to determine the frequency with which various words are used in writing, for the purpose of finding out what words we should know how to spell. These studies show very interesting results.

In a tabulation of several million words, the word "I" and its variations such as "me" and "mine", "myself" and the plural "we", "us" and "ours" and "ourselves", occur far more frequently than any other

word. "I" with its variations was used approximately one million and a quarter times. The next word used most frequently was "you" and its variations. It occurred 520,000 times. The other words that occur with great frequency were prepositions or conjunctions or articles. For example "and" occurred 519,000 times; "a" 359,000 times; "of" 332,000 times; "at" 203,000 times; "is" 185,000 times, and so on. The interesting thing I want to mention is the fact that the word "I" has the center of things. -- I am the center of my world of experience. It is used more frequently than any other word.

It is said when Admiral Byrd was soliciting funds for his South Polar expedition, he pointed to the map and told his prospective donors that they would like to name lands and seas for them. The money was forthcoming. If you look at a recent map of the Antarctic you will find the following names, Edsel Ford Range, Paul Block Bay, Sultzberger Bay, Mary Byrdland, Jacob Ruppert Post. He appealed to the individual, to his own importance. It is a strong appeal in human nature.

Take the second principle, that of self-service. A simple illustration is that when the baby is hungry he cries, when he sees the bottle he reaches for it.

The third principle of induction of behavior is very simply illustrated by this obvious experience. Look up suddenly and intently at the sky and everyone around you will tend to look up. Without elaborating these principles further, let me raise the question, just how may these be applied and how may they be useful in everyday affairs.

Since each person is for himself the center of his world of experience and his life, the corollary is, make the other person feel he is the center. Make him feel important. He will then be disposed to do what you wish him to do. Everyone wishes to be regarded as a person among persons, as a man among men. Nothing galls you quite so much as to be pushed aside and utterly ignored, and nothing pleases you so much as to be set up on a pedestal and glorified.

John Dewey says the deepest urge in human nature is the desire to be important, and Whiting Williams, noted for his first hand studies of laboring men by living and working with them, states the strongest desire in men is the wish for worth.

There are many ways in which this corollary may be applied. I shall not go into details. There are 57 varieties of ways in which it may be used. Let us mention two or three. Take, for example, the question of a person's name. Everyone likes to have his name used. A person of title or rank likes to be called Senator, Doctor, Judge, or whatever his rank may be. A gentleman likes to be called "Sir" and a lady "Madam", and everyone likes to be called by his first name in his intimate circles.

Not long ago I called the office of an airline for a reservation. The young man replied, "I will hold the reservation for you, Sir, on the one o'clock plane." At once I felt a little more important and a little friendlier toward the line.

The Rice-Stix Service Bureau of St. Louis reports that a salesman was famous for the way people flocked to his counter. He had a generous way about him, a smile for everybody. He was definitely interested in the individual as an individual. As a result of his careful attention to every one, he was able to remember most of them by name or face and most of them already were or soon became frequent customers. A customer who is treated indifferently may decide that her business is not appreciated. The ability to remember names and faces and facts about people, thereby giving them the best kind of recognition, is a magnet few of them can resist.

My wife and I were playing golf not long ago. We had exceptionally good, courteous caddies. When we approached the eighteenth green, she said to me, "These caddies are so nice, why don't you give them a quarter extra?" What else could I do?

Now, another obvious application of the principle of ego-centrism is, show appreciation. Of all the stimulants to loyal attitude and effort in the day to day relations of worker and worker, boss and men, colleague and colleague, appreciation of good work and effort is the most neglected. It is a coin that costs nothing except a little thought but it buys a commodity that no other coin can buy. Experiments in color naming, motor coordination, and similar functions which have been conducted in recent years, show that the group which received praise improved most, the group which received criticism, improved next most, and the group receiving neither praise nor criticism improved the least.

Many a time have I seen a word of praise stimulate an inner drive as nothing else could. It caused the recipient to exert effort beyond all previous bounds. Even among friends appreciation is woefully neglected, and in family circles it is almost unknown. Things members of a family do for each other are taken so universally as a matter of course that a word of praise is like a refreshing drink in a desert. And how it oils the family machinery!

I wish to stress the importance of sincerity and genuineness in expressing appreciation, otherwise the whole thing is simply sounding brass or a tinkling cymbal.

You will recall the letters written by Lord Chesterfield to his son in which he outlined every detail the young man ought to learn to do. -- A critic remarked that if you did all those things you would have the morals of a courtesan and the manners of a dancing master. Praise and appreciation must be genuine.

The next method of using the principle of ego-centrism is to ask the other person for a favor. Benjamin Franklin said, "To make a man a friend, ask a favor of him". I could cite you many illustrations of that from practical experience of we had time.

Another way in which the principle of ego-centrism may be applied is this. If you have made a mistake, be a good listener and let the person affected by your error talk himself out.

If the other person has made a mistake, make it easy for him to save his face. It adds to his importance.

Another suggestion is, ask the other person how he would correct his own mistake and how he would punish himself. I have applied this principle frequently in my own organization. Not long ago, I had occasion to criticize a telephone operator. Apparently she was not attending to her job as fully and actively as I thought she should be. Instead of calling her in and reprimanding her, I said to her, "I am not going to scold you about it. How would you correct it?" The response was splendid. She suggested many more ways to bring about improvement than I would have thought of. It works if you apply it honestly and sincerely.

Another suggestion: let a man feel that he is a conquering hero and a woman that she is a beautiful heroine. Men and women differ from each other chiefly in their attitudes and behavior toward each other by virtue of being of the opposite sex.

Julian Huxley, Secretary of the Zoological Society of London, tells that a woman came to the zoo and asked the keeper whether the hippopotamus is a male or a female. "Madam," the keeper said, "that is a question which should be only of interest to another hippopotamus."

Only in the attitudes toward each other are the differences marked. Milton Wright relates that in the French Parliament one of the deputies, making a speech urging the improvement of the legal status of women, cried out, "After all there is very little difference between men and women". And, according to Wright, the entire Chamber of Deputies shouted as one man, "Long live the difference".

Now, then, the second principle I want to discuss very briefly is that of self-interest, self-service. Actions are driven from within but designed to serve the individual. The corollary is: Make the other person feel that what you wish him to do will be to his interest. Self-interest is the prime mover in man. It is the heart that pumps the bloodstream of life. It is the invisible power that makes the infant cry for food and the adult move mountains.

Do not confuse it with selfishness. It is not a despicable trait but altogether a most desirable force. It simply means serving yourself without interfering with others serving themselves. It even

includes helping others to help themselves for that is often the best way in the long run to serve yourself also. By self-interest I mean enlightened self-interest. Selfishness is unenlightened behavior.

There are many illustrations that you can cite, if I may go back again to use an illustration from farm life. When I was a small boy on the farm, it used to be our job to put the calves into the barn at night. As you know, it may be a very difficult job. One evening we had a particularly difficult time with one calf. My father noticed it and came over to help us. He took hold of the calf's head, put one finger in the calf's mouth and led him into the barn. We were trying to push the calf into the barn, which didn't work very well.

On a higher level of human nature, the same principle operates. Not long ago I met a friend whom I had not seen for some time. We sat together on the train. As we got off, I said to him, "You go in on the 8:19 in the morning?" "No", he said, "I usually go on the 7:51 and frequently on the 7:33. I used to go in on the 8:19 but not since I have been working for myself."

During the depths of the depression, the hoarding of money demonstrated the power of self-interest on a momentous scale despite anything that was done. You remember the hoarding became so serious that a committee was appointed headed by Colonel Frank Knox for the purpose of urging people against the hoarding of money. If you look at the records of the amount of money in banks, you find that this effort had almost no effect on the amount of money hoarded. The curve went along ordinarily at about five billion dollars of money in circulation. As hoarding began, as people were scared of banks they took their money out and the amount of money in circulation went up. Then this committee began to function. If you look at the curve, you will find there is just a little dip for two or three months and then it went up faster than ever until it came to the bank crises early in 1933.

What is the explanation of it? The explanation, in my opinion, is that the appeal did not take into account self-interest. No matter what was told people about the safety of their money and about banks they paid no attention to it. Every man thought for himself, "That may sound all right but I want to know where my money is". Unless it could be shown that it was to their benefit not to hoard, they would continue to hoard.

Experiments, for example, conducted in recent years show that effort is greater, progress is more rapid under competitive systems, under conditions in which self-interest is allowed to operate. The recent report of the committee, headed by Dr. D. A. Prescott, for the American Council on Education concludes that "self-interest is the dynamic core of an affective life" and "gives the key to effective methods and materials to be used in education".

Another interesting illustration of the operation of self-interest on a large scale is in the reading of advertisements. Dr. Kaufman referred to some work that we carry on to determine the amount of reading there is of advertisements. I recently asked the man in our organization who is in charge of that work this question; what makes people read advertisements? In the past seven years during which we have carried on this program, our organization has covered by personal interview approximately 2,000,000 individuals scattered throughout the United States. These two million individuals reported having seen or read about thirty-two million individual advertisements. With this large background, we have a record of the extent of reading of each of these advertisements. I asked this man in our organization, what makes people look at advertisements? What is it that makes people read them? His prompt answer was "self-interest". I said, "How does it work, in what way is it self-interest?" He said the advertisements people most frequently stop to read are advertisements that do or offer to do something for you: "This will make me look better". "This will give me more money". "This will enhance me in the eyes of my friends, or this will impress my friends". "This will protect me; this will taste good; this will make me feel more comfortable;" and so on.

I said, "What kind of advertisements do people not read?"

He said probably the one kind that is least read is the kind that deals with mechanical operations and mechanical details of a device that is being displayed. Apparently the explanation is that it does not have an obvious self-interest appeal; it does not tie up directly with what this may do for the individual. After all, how the gadget is made does not interest me so much as what it will do for me. "This makes me look young, this makes me work better" -- and the like are what interest us.

One theatre has discovered an effective means of making women remove their hats. Just before the performance, this notice appears: "The management wishes to spare elderly ladies any inconvenience. They therefore invite them to retain their hats." All hats come off. People like to be regarded young.

Now, to be more concrete in the appeal to self-interest, I want to suggest a seven step formula for the application of the principle of self-service.

If you wish anyone to accept your ideas or carry out your course of action, or desire to negotiate an agreement, apply the law of self-interest and take the following seven steps:

1. Decide upon your objectives; determine what you wish the outcome to be. Decide just what you wish the other person to accept or do. This is the first important step. If the process of winning acceptance of your ideas or of securing action is a long and complex one, set up intermediate objectives to be attained one after another.

Step 2. Study the motives of the other person. Analyze his specific self-interests in the situation. To help you do so, picture yourself in the other person's place and see what your motives and self-interests would be.

Step 3. Make certain your objective is fair. Reconsider your objective in Step 1 and make certain that this objective is as fair to the other person as it is to you. This is hard. It takes almost super-human detachment but it must be done. Remember there are three sides to every situation, your side, my side, and the right side. Only the right side should prevail.

Owen Young, a master in the fine art of human relationship, said, "the man who can put himself in the place of other men, who can understand the workings of their minds, never need worry about what the future has in store for him."

Step 4. Appeal to the other person's self-interest. Determine how to approach the other person, what to say, what to suggest and how to appeal to him. Get him to see that the outcome will be of service to him. That takes penetrating insight into human nature, keen analysis of the particular person concerned and superb skill in your own thinking, speech and behavior. Unless the outcome you desire also serves the other person, it is probably unworthy. Your task is to show the benefit to him. Let me again emphasize the necessity of sincerity backed by sound analysis of the situation and the interests of the other person, otherwise you are merely an empty sound and your tricks will deceive no one.

Step 5. Anticipate his reactions to your appeals. Try to foresee the other person's response to your approach and imagine what he will say or do in answer to your ideas, suggestions or proposals.

Step 6. Prepare your response to his reactions. After you have anticipated the reactions, determine what you should say or do in response; and --

Step 7. Always keep in mind your ultimate objective which you have set up in steps 1 and 3. This will save you many mistakes and many wrong approaches.

I cannot take the time to illustrate this formula but I think you can see how it may be applied. I want to say just a word about the third law of motivation, namely, the law of induction. Behavior may be induced in others by appropriate behavior on your part or, stated another way, behavior on your part induces like behavior on the part of others. Call it what you like. I am not going to try to split hairs about what it should be called, whether it is imitation or instinct or conditioned behavior or whatever it may be, the fact is that adults and children after a certain age respond in this manner. To avoid raising for the

moment any question about it, we will simply call it induced behavior. I made an experiment some years ago in handwriting which is a pretty definitely established habit in grownups. I presented to a group of people three samples of texts, one in typewritten form, one in vertical script, and one in slanting script. I simply asked the people to give me samples of their handwriting by writing the three paragraphs before them. We designed a special scale for measuring the slant of the letters. We found that the slant of letters varied unconsciously, according to whether they had before them the slanting style of writing or the vertical style. The average difference was between seven and eight degrees in the amount of inclination. When these persons had the vertical sample before them they tended to make more vertical letters than when they had the slanting sample before them.

It is said that shortly after the Civil War someone invented a safety razor but the safety razor was a failure because it was at that time the fashion for men to wear beards. Gillette apparently invented his safety razor just about the time when men were all shaving themselves. Fashions go by long waves of imitation and induced action.

Now, there are many ways in which this principle can be applied in practical affairs in dealing with people. For example, when you are dealing with someone in a situation in which there are apt to be strained emotions, the obvious way is to be calm yourself. Calmness in you induces calmness in others. To avoid clashes of opinion, calmness is absolutely indispensable. Again, I can cite many illustrations and you can also if you look back at your own experience.

Another suggestion is, don't meet flint with flint. If you do, the sparks will surely fly. Remember Aesop's fable about the wind and the sun. Each tried to get the coat off the pedestrian's back. The wind blew but the harder it blew the tighter the pedestrian pulled his coat. The sun shone and the pedestrian gladly took his coat off of his own accord.

I might mention a list of ways to induce behavior in others by appropriate behavior on your part. Be sincere, be fair, agree with the other person on something, with whom you are trying to work out a situation.

I might emphasize at considerable length also this principle: Guide the other person's thinking and you will guide his actions. Do so by questions and suggestions. Don't assert, ask questions; he will do his own thinking and step by step he will follow your ideas and arrive at your conclusion. The beauty is that he will feel he has done it all himself.

Leslie Stephens said "the only way which one human being can properly influence another is by encouraging him to think for himself."

Pope, who was one of the canniest analysts of human nature, made this pertinent remark,

"Men must be taught as though you taught them not,

And things unknown proposed as things forgot".

Another suggestion of course is finally to ask for action. In many situations after all preceding steps have been taken you can secure action only by asking for it.

And now my last suggestion. When all the other things fail, as a last resort demand action but do so only as a last resort and only if you are in a superior position to do so. If you are in a superior position to force action, do so only if you are able and willing to take the consequences in case you fail.

Let me emphasize this above all things. You need to resort to force very, very rarely, far more rarely than you think, particularly under strain. Force should not be resorted to more than once in ten times with children and not more than once in one hundred times or a thousand times with adults. Even if you win by force, you often lose. Napoleon could command a million men to die for him but not one to be his friend.

Now, what can you do? I suggest this one thing that you can do. Study human situations. The next time you run into a difficult problem, and I venture to guess that it will be tomorrow or the next day and that it will be a situation in which the human behavior is the important element, I suggest that you analyze the situation according to my seven step formula and make a determined effort to apply it. You will see how different the solution and outcome will be. The need of studying human situations is very great, if you stop to think of the many situations in which human affairs and human behavior are involved.

On the broader scale we need to know a great deal more about human nature and its operation in public affairs as well as in business. Take, for example, the business cycle. It is one of the most serious things that occurs in our affairs and in all countries of the world. I think it is mostly a psychological phenomenon, yet we know almost nothing about it. I think if we trace it back to its origin, we find that it is rooted in the operations of human nature. Yet we know very little about it. It probably cannot be changed by legislation or at any rate changed only slightly. It can probably be mitigated only by a better understanding of human nature and how to influence the actions and sentiments of men. I could elaborate on that particular phase at considerable length if we had the time.

Cause and effect operate in human nature as well as in the physical world. That's why I believe you can establish principles about human

nature and in human situations. I tried to point out in simple terms what some of these are. Cause and effect follow almost as inexorably in human behavior as day and night. Astronomers tell us there will be an eclipse of the sun in the year 2144. That is the acme of science. If sunset follows sunrise 100 out of 100 times, then looking up at the sky will cause your companion to look up probably 99 out of 100 times and calming your emotions will probably calm those of your companion at least 90 out of 100 times. Attitudes, ideas, emotions, desires and actions follow one another in human situations almost as inevitably as the ebb and flow of the tides.

"First, then, to thine own self be true and it must follow as the night the day thou canst not then be false to any man."

The most important thing in business is management and the most important part of management is the management of men. Most of a business man's time is devoted to it. His hardest problems are connected with it. Materials and money are secondary. To get materials and money he must first deal with men. Skill and strategy in dealing with human nature are basic.

Henry S. Dennison, one of America's able business men says, "The executives who manage men are the key men in the bettering of company efficiency. Learning how to manage men and how to work with them so that they give the best there is in them is, therefore, of first importance to business men. For the great mass of business men this art must be learned if it is to be mastered. For one who comes by it naturally, thousands must study and practice improvement."

This is also the most important problem of government and society, indeed, it is one of the most important things in life.

Alexander Pope said "the proper study of mankind is man." I shall take the liberty to say the most valuable study of mankind is man and perhaps the greatest study of mankind is man.

William James, the leading psychologist in America during the last generation, was invited to address the graduating class of Wellesley College. His advice was "Know men".

Let me repeat, therefore, what I said at the beginning, the greatest need today is better understanding of human nature and a determined effort to use that understanding. Know yourself and know man but it must be man in his entirety, what he is, what he does and why. Then you will know something about your fellow men and how to deal with them.

Lecture IX

THE RELATION OF PSYCHIATRY TO PSYCHOLOGY AND TO PRACTICE

Adolph Meyer

THE RELATION OF PSYCHIATRY TO PSYCHOLOGY AND TO PRACTICE

by

Adolph Meyer

To be of the best help to you in this course of orientation, I ought to have heard the lectures of my predecessors. I might ask what have you come to think of when the word "psychology" is mentioned? And next, what does psychiatry suggest? What do you know and what should the average citizen know of this relation of psychology and psychiatry and especially of practice? What should you first think of? Whenever psychology is mentioned, one is tempted, of course, to follow the traditions of thought with which one has been inoculated.

As far as possible I want to show you today how I developed my conceptions and what I imply when I say that psychology is the functioning of the person.

You have heard Professor Overstreet, you have heard Dr. Gesell, the student of the infant and child, then the educator, Dr. Judd, the experimentalist, Dr. Langfeld, then the social psychologist Gardner Murphy. You have heard the parapsychologist Rhine. You have heard the animal psychologist, Dr. Yerkes, and the practical psychologist, Daniel Starch and psychoanalyst Sandor Rado. So you must have received a rather complete composite picture. Now, I wonder what you expect and where you now stand after these actual discussions?

Do you think of "the mind"? Or do you start from "the soul," or do you think you will be able to join me when I have to speak of the whole of man, of the person? And if it is the person, is it the objective performance of a live organized body, or just a kind of subjective entity? Is it the organismal behavior of the person you see and can touch, and such as you are? I would say yes; it is the organismal behavior of the person as far as it operates with the help of our meaning-function and sense, with that particular function that makes things hang together in terms of meanings and in attainment of purposes. I sometimes speak of this behavior and function as ergasia, as that working as person which constitutes our behavior, including the internal workings as well as in its external workings in the relations with the facts of the person's life, in contrast to physiology, the working or function of detachable organs and parts.

I am a physician and a teacher in medicine and a psychiatrist dealing with man when the person does not work well. I am a teacher and want to see to it that every medical student, and I should like to say that every cultured person, should have a conception of "man as an entity functioning as person." Our anatomy and physiology also deal with the organism, viz., with its structure and its function when studied as parts; but we have to study not only the internal organs of digestion and of elimination, of respiration, of circulation and the trunk and the extrem-

ities and the head and the nervous system, or the brain; we have to be ready to study more than parts. We might study the organs as we can detach them from the animal in physiology; but we still have to study the person.

So, I say the psychologist is concerned with the living person, that individual as "a live organism in action," that which our language allows us to cover by these very simple words "he" or "she" or "you" or "I"; that kind of "somebody" whom we want to specify and know more about whenever we are introduced to another so that we may not only recognize each other but have a reasonably dependable idea of what we are and can expect of each other; it would be a kind of summary biography contained in the name, and in the wherefrom, the occupation and social and civil status and the range of competence and of education and of position. That is the tangible material that we would call person and "person function" and I would say that that is the material of psychology, not just a snatch of introspection but the fullfledged functioning of the individual as a person, as a he or she.

There was a time when psychology really did point first to the soul in the abstract, and to what was called mind and the self, the data largely of introspection being singled out of psychology, as if in contrast to a body; that which only the individual could report of himself. It treated sensations as the elements out of which the whole mentality had to be synthesized and it used experiment only for descriptive purpose. That is not my psychology. I know that also; but that is only part of the functioning of life. The minds that I have to study when I speak of psychobiology or of ergasiology or of behavior as person or just person function is the functioning of specific live persons, body and soul as one. It must be like any other science, a body of facts accessible in the other as well as in myself. It treats the facts objectively in terms of experiments of nature, taking the person as the unit in a genetic-dynamic process of differentiation and productivity. Today we think of "what kind of a somebody" we deal with, the behavior, the performance of anybody, of the other as well as our own, the self. We think of "the person alive" whether we are dealing with the as yet "unborn", or an as yet speechless "infant", then as a child, a youngster, an adolescent, an adult, young or mature, or a senescent; always an organismal entity with a characteristic feature in contrast to what is just the physics and chemistry and the physiology and anatomy of it; it is a part of a history; it is a history in the making, a more or less historically organized entity; that we call the person.

It is always an individual with a history and an outlook in a situation, with the now and a past and a future in action; and we are interested in what we can expect, and what he expects, what he or she includes. We really mean the person with a record, and not only either a body or a "mind" or a "soul". We treat the person as an experiment of nature with history in the making and all the facts operative in the development. There are no detached minds within the range of what we

have an opportunity to study with the methods and the range of thought that I am going to discuss with you.

We always look for the person in actual life rather than what it would be in the abstract and in the thought of eternity. I do not shun or evade the thought of eternity; but as I say it is what a live person does and feels and is and can be expected to be and do while alive, that I have to know about. This is why I speak of psychobiology, that is to say, the person as he or she uses himself and herself in and for his and her life. When we come a little closer we are most likely to want to know what kind of sense the person has and especially what he uses. Our own practical sense today looks for the performance in life rather than mere talk. We are interested in the action rather than in mere feeling and fancy and thinking and dreaming and talking. Those are very important components but they are not all. We also pay all the possible attention to the private functions carried on not as a mirror but as a specific biological function of "economizing symbolization", the "as if" function of imagination, of which man has so much and which will have to work straight and in order to be kept working straight, has got to be treated as part of action, of behavior, of performance.

In this we are all "individuals" and we are alike only in one fact, in the fact that we are all different. I am often reminded of a little joke that was made on me by a friend of mine in Chicago who thought that we Swiss were somewhat involved occasionally in our expressions and he quoted a saloon keeper of Swiss origin, a Kasper Meyer, a namesake of mine who was very much distressed by the fact that his daughter, to whom he had given what he thought had been a splendid education, was going to marry a cobbler. The man had some of the Swiss philosophy apparently and some complexity of expression and he put it this way, "No man is just like himself; there is the mother, she is different himself and I am the same and so are you, ain't that so, Doctor?" Evidently the only way to do justice to the fact is to respect the individual history as an essential and characteristic fact to be heeded in these "experiments of nature".

All this is perfectly plain and clear in our critical common sense no matter how difficult it may be to express it in the abstract. Let us be sure that we begin at once with what is clear and what each of us lives with. Or shall we begin with intimate and ultimate details; with elements? With sensations? Or with mind, or the person as just one of those things that you cannot split into elements and still keep it alive?

Shall we speak of associations? Shall we start from "the unconscious"? Shall we start from "man the unknown"? I would say leave that to those who want to and who have particular gifts and intuitions and determinations to limit themselves to that; but we as plain responsible people, let us begin with what we all know man to be and to do and to feel, and there we have a pretty good deal of knowledge to master and something to study. Evidently, we all live our life in action, accompanied by or including a wealth of fancy. We live primarily to live and our life

includes the capacity to go through that daily cycle in which we wake up from sleep (and perhaps dreams) to the waking life, again to wipe off the slate in the next sleep, again to be ready for the next day, fresh for the next day's needs and emergencies and problems. Both sleeping and waking have to be orderly performance if it is to be in the service of well-being and of health. Of psychology we expect a statement of what determines the actual ways, how we come to behave as we do, some days better than others. We look for order, if not for many fixed laws; our laws are not very fixed. I say we look for the order of what may be expected and what we can expect of ourselves and what others can expect of us and what will make for the better or for the worse; and then we see how and where we can have our choice, that we can have our perspective, our selection and our performance. All this is not allowed to rest with mere description, but as live developments, as experiments in the making, sensed and treated as dynamic processes, studied for the conditions under which it works, the factors that enter, the role they play in the concrete events, the results and their modifiability.

Now, the physician, the psychiatrist is supposed to come in when the person is not normal, that is, when we speak of pathology, the kind of thing that "befalls" us, that which we cannot straighten out without some technical knowledge and with the appropriate sense. Hence, our first task in us is to keep alive, to maintain and sustain ourselves and to be ready for the ever renewed waking up to the opportunities and the necessities of every time that we emerge from the quietest form of mental life, sleep, to the best and greatest opportunities that we have to meet as life; our second task is to arrange our life for activity and rest in an orderly rhythm; third, to have the "person function" and mentality work in harmony with our capacities and our needs and according to what we belong to and that means according to the culture that we are a part of and aspire to be samples of. We call normal that which works, always just good, bad or indifferent. It is always a question what we should call normal; we had perhaps best say that which leaves and keeps or makes us fit to go on further to what works. I think that is the best definition I can give of normality: just good, bad or indifferent, but at least leaving us, or getting us, fit to go on with what will work -- it is all a problem of viewing the facts in terms of an experiment to be studied for the modifiability and effectiveness.

In pathology, we see that which does not work so well; it may be first a question whether it is just blundering and mistakes of some of that normal part of us which is just bad or indifferent. We call that blundering and mistakes, which we can remedy ourselves, and that can happen with perfectly normal organisms and functions as we all know every day. That which we may rate as "not working so well", may not work because the organism has suffered, and is at fault through lesions of structure, either the main organ of integration, the organ that makes things hang together, the nervous system and the brain; or because of the wrong kind of support of the functioning of the brain through disorders of feeding and elimination and the functioning of the metabolism,

and all its regulators, such as the glandular resources which might make it impossible for the otherwise normal brain to function properly until it again gets the right food and circulation and elimination, the right self-regulation. But there finally are also the most frequent disturbances which are not to be attributed primarily to something that we would know as an injury to the brain or as a disease of a palpable kind, or a malnutrition of the brain and things of that sort. These are disturbances and clashes among our functions and attitudes and emotional relations that can queer our functioning, as fears or suspicions or delusions, fixed beliefs which just do not work, and which we must learn to know and deal with as faulty experiments and for this we have to learn to respect our relations of life.

We are now in a position to sum up our concepts: What do we mean by biology? To me, biology means the science of life including also all the mental activity that we are capable of. The idea of biology holding just for the body without the mind does not harmonize with my knowledge of life, of a living entity, with life starting as a fertilized ovum, as a vegetative organism, as a new born, as an infant, as a child, as something that requires all the social assimilations of a real human being. That is life and that is the domain of biology, the study of organismal life, an experimental science, working primarily with the whole undissected units, the topic of our science, necessarily including all our mentality, in fact and not as a mere adornment or epiphenomenon.

Well, then, what about anatomy and physiology? That, of course, is the study of the structure and function of the whole body but very largely from the point of view of the composition and the functioning of parts. And what about chemistry? That certainly is a study of the processes that keep the complex organism going and alive. It is a process that plays its role in the parts without which life would not exist and without which mentation also would not exist and without which subject-organization or person-organization could not exist. There is then a great deal of physiology and chemistry which cannot be understood and regulated except in terms of person-function, our perceptions and interpretations and preoccupations and understandings and fitness of memory and foresight, best expressed in terms of everyday life and language, and in action -- as psychobiology, or mentally integrated function. How then about psychiatry and mental hygiene? Evidently psychiatry deals with the person-function, but only that part in which things do not work so as to leave the organism ready for new action in good form. Mental hygiene deals with the working for the health of the individual, whereas psychiatry works more with a view to treating sickness. The whole experiment and science of life in health and sickness, to my mind, might perhaps best be called the bio-dynamics of the person, a study of the factors that determine the tendencies of life and the concrete events. The study of the use and abuses of these assets and performances is what I call psychobiology, and if I also use the term ergasiology that ought not to be hard to understand. That is the expression that I use so as to have a convenient noun in singular and plural, and for the pertinent adjectives

(ergasic) and a convenient term holding for the multiple modalities of mentally integrated concrete life that I speak of in my practical work in psychiatry just as in daily life. It is the erg in the Greek "dialect" which in English we give the sound work in general, in physics. Ergasia is the working in the business of fullfledged life that I call psychobiology or ergasiology. When, then, might we speak of psychology in general? It includes the organism asserting itself as a person, as the he or she expressing himself or herself in terms of being well or in disease, i.e., being ill, ill at ease, in security or insecurity, fit or unfit, voluntary or involuntary, meeting problems and behaving and acting with what we call full consciousness, being in one's full "senses" or perhaps not in one's full sense. The chief question is always "with what kind of sense", i.e., how the person uses itself and its potentialities in the specific situation.

I wish more people would realize that in psychology and psychiatry they are touching the ground of "the more or less" of the sense. And it is to the person, body and soul undivided, that we ascribe this sense and memory and experience resources and not only to the part. The extent to which one is using one's sense, that is, one's range of understanding and orientation and one's self direction in a grasp of the situation and actual performance, that is what we want to pay attention to and that makes the person. I am here standing and functioning, attending incidentally to my vegetative functioning and circulation, to my ordinary physiology or life maintenance, but also attending to the total situation with and through my subject-organization, attending to the opportunity as well as the task that you give me, for the development of my thoughts in your presence -- my subject organization and activity of the moment in mustering the potentialities of the situation, to be shared in a group.

And thus I speak of person-organization, and of character, that which I look upon as more of the total history of the performance that I now engage in, in the light of the whole of life, and all that I stand for.

In order not to leave any doubt as to what technically I speak of as ergasia and its discussion and management in psychobiology or ergasiology, I sum up, that I speak of the behavior, of performance, of the workings and the work, the functioning with more or less consciousness, the organismal function carried on in a flow or solution of that sign-function we call sensations, images, ideas, attitudes, reactions and more or less well considered action, with experiencing and experience with the help of memory and fancy, anticipation and comprehension and, in general, the needed kind and amount of sense, i.e., the way the unit, the he or she uses itself and the factors of each task and opportunity. We refuse to make a puzzle of what we are familiar with, and we "go to it" without any need for reaching either for hocus-pocus or for overlearned conceptions. We can include our best in that we have to see to it that on this foundation we rise to and create the best that is in us and that we belong to. We study and use what is at hand and accessible in terms of the facts

at hand, and the data of the antecedents and the outlook, studied and practiced in terms of experiments of nature and life of individuals and groups, before we turn to the "obsessions of the something else", be it anatomy or physiology or chemistry, or culture issues usually too detached from individual function.

Now, psychiatry: It deals with what we are liable to and may need medically experienced help in. I mentioned the fact that we are liable to blundering, to mistakes, but also perhaps to not being all there, either from make-up, through deficiency or through oddity of our make-up or carelessness and distraction, or through a defect that has come to us, a damage done to us as through injury or damage to the organism involving the brain and its function. When there is brain disease we have to recognize that it is something that has happened to or in an organ which is made to last for a lifetime in a cumulative continuity. It is not like the limb of a frog which in the frog will grow again when it has been cut off. If anything has happened to the brain, there is a deficit, and what is left has to do the work. The brain of man is made once for a lifetime for each person and it has to be accepted and treated as such. This is why we get confronted with the fact that there are a good many whose brains have suffered who remain as not any longer a full asset to society but having to be respected for what they are and treated for what they can reconstitute in and through themselves and with a readjustment of the whole organism or person.

In contrast to the diseases with actual brain damage, there are temporary disorders of intoxication, of temporarily inadequate metabolism and support. There are, further, -- the most frequent disorders -- the disturbances that are essentially incompatibilities rather than loss or actual disorder of particular portions, disorders of the interfunctioning and, of course, of those there are very many and common ones: deficiencies of intellect or application, or false use of intellect not in harmony with reality; carelessness and habitual dilapidation of interests; and then perhaps because of emotional disturbances we get that which does not activate any longer the leading regulators. We meet with depressions and excitements and I shall give you a sample of that. We get disturbances of the intellect, of correct ideas or incorrect ideas, of correct and of incorrect reasoning. I might mention the squarer of the circle and the crank who pesters some institutions; the reformer who wants to reform without adequate facts and those who cultivate a grudge, those who cultivate revenge and ideas of destruction and crime, and the paranoia with its systematized highly reasoned convictions on false premises; or we see habitual volition disorders in the direction of alcoholism or some of those special peculiarities we experience only under rather unusual conditions, such as stupors and cataleptic states, in which hypnosis-like alterations of function play a role. Depressions and excitements and having false ideas and illusions, after all, are pretty close to average life. We are dealing there with disproportions of average resources. When we get changes that resemble somewhat what happens in hypnosis, that is unusual largely because after all hypnotism does not any longer belong

to the daily diet of humanity as it used to do in the days when "sorcery" and "states of fascination" were commonly resorted to in religious and ceremonial rites.

Evidently these are all disorders which all of us know, to be inquired into as if they were experiments, readjusted in performance according to capacity. We know mere nervousness, exhaustibility, instability and non-dependability; we know emotional tantrums; we know conflicts that disable us and that disable some people so that they are not very well fit to live with themselves, not to speak of living with others. There are conditions in which the person gets rattled, quite able perhaps to work in favorable conditions but with faulty makeshifts and then getting into sickness, perhaps even utilizing that sickness, feigning sickness, with self-deceptions and deceptions of others, complaining and simulating, perhaps suffering from fears and from anxieties, from obsessions and from various tricks like those that I referred to as belonging to hypnotism -- feelings of being under the influence of others, or of mystical forces, and easily suggestible. Think, for instance, of what we read only recently in the newspapers of an epidemic of fainting in a group in a R.O.T.C. camp: quite obviously something that may have been genuine in some, and then came as a sort of natural "doing likewise" and participation on the part of nearly a hundred others. Those things are not very common today but they do occur. There are those who, for instance, in the War period one saw quite a little of, who become temporarily blind or mute or deaf or paralyzed in so-called shell shock, as a matter of fact probably to a very large extent as part of scare and fear and self-suggestion; and in the state of fear there come these archaic submissive ways of reacting so that the patient with perfectly normal eyes and with capacity to see does not use it for the purpose of seeing and in a sense doesn't want to see. The same with hearing, the same with loss of speech and gait and self-direction. It was plentifully seen in the War and without that supposition that all substitution or dissociation had to be referred to some sex difficulty. Some would admit that it was just plain fear; but with some people fear was able to act that peculiar way and to produce that sort of dropping into the abnormal with all the automaticity of hypnotism-like reactions.

All of this comes under the heading of nature's "experiments", events first to be studied and intelligible in terms of the concrete situation at hand before one rushes into theorizing yielding to the "obsession of the something else", unless the obligatory examination in the anatomical and physiological functions call for it: in brain damage or intoxications or deficiency reactions or infections, or the senile brain shrinkage and the like.

There obviously do occur disorders which befall us in which as persons we do not have as much of a sound voluntary share, for instance, fever delirium. After all, that depends on our constitution and on the amount of fever and the amount of toxins. Most of you have seen that in your own experience; I am sure there is not one that is not familiar with

deliria. You have seen kindred disorders in intoxication -- without any obvious autonomous brain "disease". There also are depressions, elations, fixed ideas, convictions with fancies and imaginations -- which appear as transient symptomatic disorders on ground of general non-mental disturbances, but after all, apt to be dependent on personal predispositions and antecedents. I refer you to an exceedingly interesting and readable little book by Charles Macfie Campbell, "Delusions and Belief", published by the Harvard University Press in 1927, with an attractive and clear account of the kind of thing that can occur normally and then also abnormally, according to the circumstances under which the individual lives and grew up. Some of those which would be utterly abnormal with us may be perfectly normal in another type of civilization.

I have to limit myself to but a few samples of disturbances and our way to treat them as "experiment of nature", more or less modifiable.

I will just give you an idea of for instance an elated condition. I have here a copy of a telegram from a fraternity to the mother of one of the fraternity brothers. They write, "We feel you should be informed of your son's condition which seems to demand immediate attention on your part. He is full of hallucinations (they use the word hallucinations wrongly; hallucination technically is abnormal sense perception and they use it as wanderings of "the mind", but you will see how concretely it is acted out) about making and borrowing money and he buys everything he sees. He is causing much embarrassment to the fraternity and to the town merchants and we fear he is incurring too many obligations which may eventually fall upon you. He has purchased furniture to the value of \$300, a \$500 player piano, a large Victrola, a radio set, over \$200 worth of clothing. He has ordered a LaSalle roadster. He is endowing the university with a \$100,000 life insurance policy. He is attempting to charter the new theatre to bring a musical comedy company here from a neighboring place at a cost of \$1000. He wants to install a telegraphic stock ticker in order to play the stock market. He is not attending his classes regularly." How could he? "And he is taking frequent trips to some other place in hired cars for the purpose of taking pipe organ lessons. His condition is growing steadily worse and demands some action immediately."

Now, of course, it is a very nice thing also to have a sense of humor and a laugh as one hears that sort of thing but these are real facts and they belong to the most distressing conditions that one can have to deal with. Here is a person who gets into a state of exhilaration with a feeling of power and capacity in which he doesn't want to be disturbed, and which can last for months. It is the height of thrill; he has the time of his life. But he also proved subject to an equally deep period of depression before he recovered after two years.

That sort of thing can occur either in paresis, i.e., in brain syphilis, and in that case it would show with special neurological and serological deficiencies. In our case it occurred without any such

foundation, out of the temperament and out of the situation and out of hereditary dispositions and bringing up. It is not everybody's fate but when it does occur, what shall we do about it? How do we obtain and use the understanding of the experiment of nature? Is it so unintelligible? You will hear more about that. I could in a similar way describe to you the condition where the patient becomes strangely disorganized, as in the following case: A young man at 19 was in great conflict about masturbation. When nearly 20 years old he began to be troubled with ruminations against the supposed "tyranny" of both the father (a minister) and the mother, a sample of that great modern grievance cult -- very much like the modern inferiority complex cult -- a terrible feeling about the father and the mother who sometimes are bad but certainly at the present time are not always given the benefit of the excuses the youngsters expect for themselves. At any rate, there are parent-son conflicts with actual fancies to kill or to commit suicide and the like. Who hasn't seen those in juvenile tantrums sometimes? They are mistakes and blunders and undesirable and usually a mere mood indulgence; but, in this and many other cases, developed into monthly spells of being out of sorts, fearing and hating people generally, culminating in hysterical crying and screaming spells. For a time there were some hallucinations with it, of hearing a woman scream which he now says was part of his own thoughts. He realizes that. He believes he is neurotic, but it goes to unusual extremes; he experiences queer feelings that the skull is pressing on the brain, that he is losing his mind; he feels like a slave, with forced obedience; he has difficulty in concentrating and remembering. That is his own complaint. He also says on one occasion he was half boy and half girl and should have been sterilized. There evidently was a lot of sex fancy, immature and uncritical and very disturbing. He dislikes the nurses because they made light of his symptoms. He had a number of spells in which he appeared to attempt suicide. There we are dealing with a situation that is no longer very simple; nevertheless we have to learn to see that some of it is the excrescence of relatively normal functioning under abnormal conditions, conditions that are not directly referable to a brain lesion. Of course the condition of the brain must be in keeping with what this young person goes through; but the disease is not to be explained by anything we might know and be able to use in terms of brain. You can look at the brain and do what you like about the brain and talk about it. But what you have to try and do is to see that you get the experiment of nature of this person and his functionings into order and to bring into operation and behavior whatever experience has taught us to do to bring the young man into a more normal and orderly orientation with life. We deal here with an experiment of life which requires a long time program, perhaps of a kind which has to try and make up for the lack of much success by gain of what is needed for preventive treatment or by shock therapy, when "the next case" presents itself with early indications.

We thus come to problems of "psychotherapy". I perhaps ought to say simply therapy rather than psychotherapy because most of you would probably think that is trying to do something largely with the person's

ideas. I want it to be an adjustment of the person by using what works, by sharing and mutual understanding, by guidance of the life not only in words, but in deed, arranging it so that the patient can keep pace with the environment, can get real satisfactions, can get his rest and sleep and wake from it with the feeling that there will be real satisfaction ahead and not only blundering. It is not mere talking cure that is implied in "psychotherapy". Psychotherapy is the cure of the person in attitude, reaction, and action: the person functions sometimes with what works within the patient, sometimes with things that we suggest and bring into the reach of use of the person on ground of adjustment of the general available functioning of the patient.

So, it is the guidance of life, not only in words but in deed. It is help in re-evaluations, in the use of the patient's actual resources and a disentangling of the impressions, memories, interpretations, and imaginations, fears, poor thinking and sloppy action in a wider setting and in a mode of functioning in which also the various organs and functions are brought nearer a normal use in work and play and sleep: The intake and elimination of the food and also of the actions and experience and interests, in short, a safer balance of actuality and of fancy and a balance of special involvements, in general an adjustment of the human functioning and human relations, using the patient's assets and material in the perspective of the patient's experience rather than dictation and preaching, with due attention also to the periods of time required in the adjustments.

Those who have difficulty get into more difficulties when the normal just laugh at them or get mad at them or complicate things in other ways. A great deal of course is said today about the sex which has only recently become a topic that everybody dares talk about, whereas those other things that everybody was allowed and encouraged to talk about as either just malfecundity or heredity and brain disorder are usually related to the assumption that mental disorder must be something quite radically different from anything the normal produced either intoxication by focal infection, or special endocrine difficulties. That is not so simple or so frequent in our experience. We consider it essential to take everything that the human being presents as a topic of our science and therefore include the things that work normally in us but often out of place and requiring adjustments.

Now in all this therapy, so-called -- and remember that the word therapy is the same as service -- in all this service that we render we need just as much attention to the practical available resources as to any deficiencies in and disorder in the conditions of insecurity, of anxiety, of fear, suspicion, hate and actual disorders of health. We need all that which every practitioner has to use; and when we come to the more complicated disturbances of the person we must not all of a sudden declare ourselves incompetent or sidestep the personal and social life actually accessible, as absolutely normal, denying the interpretation of suggestive combinations with a blanket assertion that "such things do

not occur in our family" --when things in the record are significant, they must not be pushed aside as irrelevant or as non-existent. There are diseases that can befall the brain no matter what the family situation may be like; and there are others that point more to the character and ways of the family and total situation of the individual person including the total constitution, and the ways it is used. Important facts and factors are often disregarded and sometimes overrated, unless reviewed in the light of all the facts and experience.

Does that mean that we should go to the psychologist? I suppose you have the feeling by this time that I do not consider the average or erudite psychologist broadly enough trained. He has to be a specialist in the study and knowledge of the biodynamics of the person; just to be a psychologist without that background yields a very onesided formal psychology. Just a psychology of sex or a psychology of emotions or of testing may have its value but has to have the whole foundation of the knowledge of man and therefore a broad medical training is a requirement today, and a very strict requirement especially among the psychoanalysts who are perhaps most likely to be looked upon as those who can get on without being physicians. It is an absolute requirement that every person who wants to be a physician or wants to assume responsibility in serious conditions has to go through that training which also gives one the sense and responsibility in handling people in difficult conditions, in conditions where they are no longer able to direct themselves without technical help. Today, every medical student is led into the study of the live person as well as the anatomy of the corpse and the function of detached organs of the dog and the frog! After a personality study in the first year, he has in the second year got to learn to meet patients and to observe and bring out the facts! In the third year, to learn to examine and take charge of them, and in the fourth year to take part in therapy.

There should be no person allowed to assume responsibility with man without an adequate general biological and personal biological background and training, and equally important, the human and cultural background which must operate in a biologically safe manner. This should be our idea of all education and training for life, and certainly of all training for the specialist who has to take care as physician of those cases in which the average layman throws up his hands. Medical help, of course, may consist, as I pointed out, of perhaps just ordinary advice and seeing to it that that advice is used and can be used. But the ordinariness has to rest on a quasi-experimental interpretation of the facts at hand. That is the important part. There naturally are conditions in which the facts are more involved than the usual interpretation of daily life; but they have to be absorbed in concrete normal daily functioning.

Most of this is plain hard common sense. It starts from common sense and leads back to usable sense and usable common sense. We expect perhaps too much at present of psychoanalysis, realizing that it is an

exceedingly intensive preoccupation with certain features of individual and social life starting from the so-called unconscious, and discussed with little direct guidance; we must not consider psychoanalysis the substitute for psychiatry, which is the training of the physician for the whole person. Psychoanalysis is after all something that has been worked out on very circumscribed problems with an intensive method and unlimited time and expense, and with total impossibility of applying it to all persons. So, please remember that psychoanalysis is perhaps the function and training of particularly well trained physicians but could not be made a common practice of people who might be but onesided psychologists, psychologists only of "the mind".

We expect the use of the person's assets and the direction of the habit training and the review of the various tangles and of the false directions and misuse of available opportunity. Where we need more experience, we use and seek that "more experience" but we do not begin with "the unconscious", but with the plain accessible facts first and then the details according to the need and the necessity and the patient's and the therapist's ability to use them. Thus, we come to the practice of psychiatry. Part of it is guidance and it is arranged in the process of education and along the lines of education. The child problem, even from before birth, is not merely the education of the child but it is always the education of both parent and child, and the parent-child relationship, the child-child relationship, social and environmental relationship, and we must not forget that. Merely to expect the doctor will patch up that which a very destructive type of civilization produces is all wrong. We have the pre-natal problems. We have to recognize that the problems of heredity in man are unusually complicated and not readily settled by Mendelian rules, but in need of supplementation by other elements of fitness for parenthood. On the other hand, we have to guard against the possibility of germ damage with bungling attempts at contraception and sterilization and attempts at abortion in which one does not know what one has done to the germ. Those are very responsible situations.

There comes the time of gestation and childbirth. We have to have competent physicians so that not too many brains get oxygen-stifled in the passage to the breathing stage. There comes the infancy with the early habit training, the control of the sphincters, the emotional strains with the weaning process and the shifting of food, and the dependence on affection. There comes the joining of the intellectual order through the jump into shared language and fancy supplementing reality and the fitting of language with reality and the early social life of affection and of non-emotional relationships, the attitude of the nurses and to the nurses, and later the gang, genteel or not genteel. It is just as important to realize that the higher brackets, so-called, can require a great deal of gang regulation. Adolescence, which is by no means merely a sex problem, is the period where more understanding, more practice of human relationship, more responsibility to self and to the group comes in and also more necessity of self-government. There comes the sex guidance which has got to be according to goals rather

than experience for a long period, with the realization that in all your experiments, it is not necessary that everybody should be a criminal in order to understand something about crime. It is not necessary that we should all go through all the difficulties of life in order to be able to be prepared to meet some of them. There comes the necessity of graded presentations of the needs of life and the so-called secrets of life. There finally comes the necessity of furnishing family advice, and that is where you have either to reintroduce the family practitioner who is now being swept aside by the overspecialized, or then we have to see that we get specially trained persons and consultation facilities of family advice. Our social problems may be largely social guidance problems and not "mere" psychology, nor necessarily psychiatric, but obviously also mental hygiene problems. We may have to deal just with nervousness, difficulty of self-management, independence, protection against delinquency, alcoholism, crime, but also with epilepsy and minor and major forms of complex experiments of nature and of life. Civilization is expected to provide physicians, nurses, and conditions for the care of those who are not living in harmony with nature and the environment, who, like that boy from the fraternity, create difficulties that are no longer manageable by mere telling him or checking him. We need access to the experience and provisions for the mentally ill. What do we need?

A good many of us citizens of the United States deplore tremendously that here, in the capital of the country, we dealt up to recently with one of the most archaic organizations in the way of handling the people that have become difficult to themselves and to others. Of course, many of those who are sick do realize some of their needs but others very little; we must not add insult to injury by calling them by that ugly name "nut" and "crazy", or even the polite and legal epithets "insane" and "lunatic" still officially used. The patient might perhaps go to a general hospital and could stay there as long as his behavior might be dependable. We have here in Washington the Gallinger Hospital and the St. Elizabeth Hospital for the care of those who really need attention that the average public cannot furnish and that the average hospital does not offer. What happens? In order to be able to get help in the reasonably equipped special hospitals you had to have a permit, I think, from the District Department of Public Welfare on H Street and I Street, regulated not by physicians but by persons undoubtedly perfectly well trained according to their capacity but up against a task of discriminations which, after all, is the task of a great deal of experience, a great deal of technically trained common sense. Inasmuch as everybody has a certain amount of it, I think there are sometimes people with common sense that exceeds that of some of the specialists. But the one person who has the right to interfere and to act with the person who does not behave is the police officer. Anybody else was required to get an authorization by a layman's office or a court or a jury to reach the best equipped hospital.

It is only lately that a law has been passed which mitigates

things a little bit; but it is still spoken of as the lunacy law. No-body likes these archaic terms. Why we should perpetuate them in the very center of our public life is very difficult to say, perhaps not so difficult to understand in the light of the conditions but difficult to endure.

The laws in our District were the most benighted actually, equalled only by what still persists in one of the darkest states. Unfortunately, there is immediately a big fuss over the question of authority, the question of definition and of conformity. Every patient or mentally disturbed person immediately has to be called lunatic or insane in order to give them the opportunity for care and treatment. A large percentage of these patients are of a character that can be easily persuaded to accept help, but not so in this District. Most states now have provisions to admit patients for voluntary care. In others it can only be had under commitment, either by the police or by a court or something of that sort. A judge of the court of equity of the District had to preside and a jury had to be empaneled.

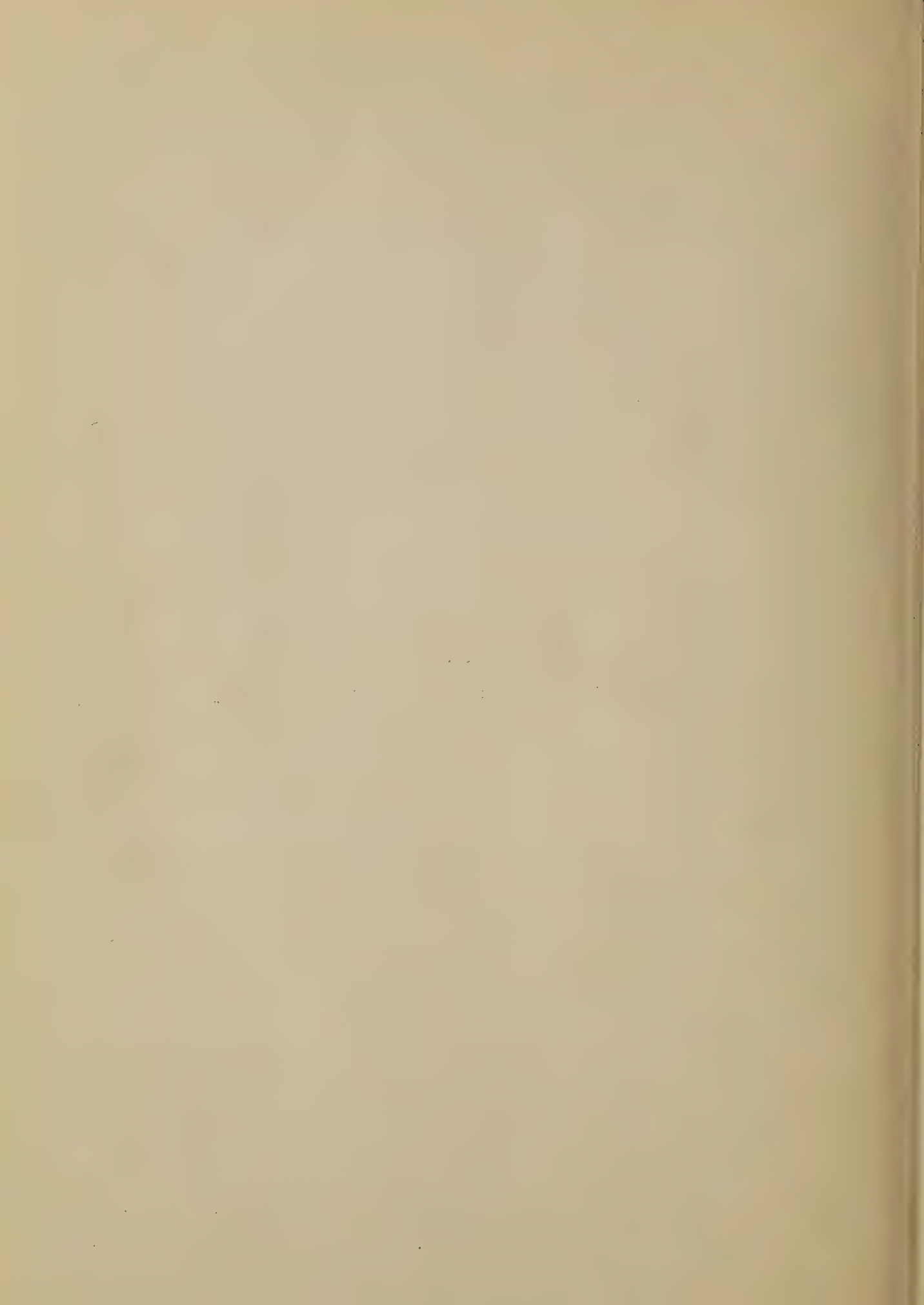
I am glad to say that is being changed now, but it still has a legal status and lingers in the public mind. You know our American citizen and how he feels. It is the police that can arrest directly -- and the patient, whether he objects to the ordinary course or not, has to be put through the mill. That is not right. Most of us treat these patients in a very different way. We treat them as our equals in a fair deal, fundamentally in misfortune or in perhaps undeserved difficulties. We see what we are able to do in cooperating with the person and it is amazing how many we can work with. At my hospital we do not accept any patients that object and have to be committed by law. We can get the cooperation free of the circumstances where under this law process patients get hurt, where they feel injured to the very core and where they behave in keeping. Of course, also many of our patients behave very differently from what we would like them to do; but unless they are insistent and cantankerous in line with the notions that usually are back of the laws, unless they demand legal help, unless they find fault with the conditions -- we do them justice as patients and we do not treat them as criminals would be treated. We treat them with explanation and persuasion and full consideration. We use what works in the patient and give him a chance to digest what does not work so well. We put them first into a ward where not much is expected of them; then into wards where a little more is expected, where more normality can come to the fore and where finally the normality dominates and digests the things which before did not work well. We provide every possible safeguard against abuses within the power of the health authorities. If a patient wants legal advice, we grant it but we do not make it obligatory for those who do not want or need it; that is the point we have to bear in mind. We do away as far as possible with humiliation. We also have the voluntary commitment, so that we can, according to the law, detain the patient for three days after they give notice so that there can be a complete understanding and arrangement as to what should be done; but beyond that we do not have any legal authorization. To this extent ours

is the rule of the police authority of the health officer. We do not let delirious patients go out on the street to be run over. We have the right to detain them even if they want to go. We have the similar right to detain anyone who needs it, for three days. We do, as far as possible, away with the humiliation and try to cultivate an understanding among the healthy and to abolish the "oh nuts", "you are crazy", the "putting them away", and the superstition that mental hospitals stamp one as "insane", that they "keep one", that one loses one's civil rights. No civil right is lost by coming into our hospital. That may become a protection which may be necessary, and for those who call for the court or who need the court, law must help. It must not be sanctioned as an obligatory and unfair and unintelligent power. Only in a free and open way can we hope for real sense, for prevention. Not everything can be prevented but we always can stand for the best use of the best sense and look for and work for the building up of a public and general hygiene and conception of that whole topic with more and more interest in healthy living.

Lecture X

THE OUTLOOK FOR FUTURE DISCOVERIES OF OURSELVES

Hornell Hart



THE OUTLOOK FOR FUTURE DISCOVERIES OF OURSELVES

by
Hornell Hart

Fellow students: The word "psychology" comes from an ancient Greek word as we all know, "psyche" or the soul. Psychology by derivation was the science of the soul. But more than a generation ago scientifically minded men in this field came to feel that the soul was a subject for religious rather than scientific inquiry and they began to think of psychology as the science of the mind. For some decades that conception prevailed but gradually challenges were raised against that conception also. The mind, it was said, is simply another way of referring to the soul -- something mystical, something elusive. If psychology is going to be scientific, they insisted, it must give up this idea of mind.

And then most of us remember that wave of enthusiasm for behaviorism. The behaviorists said this whole idea that psychology is concerned with the mind or even with consciousness is a relic of the dark ages. Consciousness, they said, is wholly gratuitous. We haven't any necessity for dealing with consciousness; that is subjective and introspective and you can't get any scientific data about it. They said thought is simply laryngeal activity. If you put your hand on your larynx when you speak, you can feel the vibration. Some psychologists hitched up their devices to the larynx of a person and found that it vibrated when he was merely thinking. The behaviorists said that is all there is to thinking, and the school of behaviorists proceeded on the assumption that psychology had nothing to do with anything beyond mere human behavior as objectively observed.

A certain witty commentator summarized this development of which I have been speaking as follows: He said psychology first lost its soul, then it lost its mind and finally it lost consciousness.

One person having heard Professor John Watson say that thought is nothing but laryngeal activity, thereupon began to speculate as follows: "That may very well be, Professor, but in that case how can we tell the difference between laryngitis and feeble-mindedness?"

It is all very well to poke fun at the behaviorists; we can kick a dead horse. Behaviorism has largely dropped out of popular interest. Nevertheless, we must recognize that this movement made a contribution which it would be a great loss for us to give up, namely, the idea that when you talk about psychological factors it is necessary to be precise and definite. When you say a child learns to read, what do you mean? Can you describe learning to read in terms which can be verified by another observer? If you say a person loses his temper, can you express that in terms so accurate and definite that any observer would agree that this person has lost his temper? Can you take any psychological factor with

which you are working and describe it accurately enough so that your observations can be checked by some other person? If not, you are in great difficulties in establishing scientific results. We need to hold on to this insistence upon objectivity. Indeed, I think it is fair to say that the outstanding characteristic of our present civilization and perhaps the basic cause for the tremendous achievements that have been made in our civilization is the development of this method of empiricism, this insistence upon accurately defined observation of sensory experience and the insistence upon verification of those observations. Having said that, we must recognize also the absurdities into which behaviorism moved. Many of these people who became extreme exponents of the empirical method -- the positivistic method, this method of sensory observation -- many of them became intoxicated with their point of view. Instead of taking empiricism or behaviorism as a technique of research, they began to erect it into a philosophy of reality. They began to act upon the assumption that nothing was real unless they had measured it, that nothing was true unless they had proved it in their laboratories.

Now, that extreme mechanistic and materialistic philosophy has been sweeping forward in certain respects in psychology even in recent years. For example, in several of our great laboratories experiments have been made recently measuring the electric currents which accompany thought. Two electrodes are fastened to the head, one at the forehead and one at some other point. Very delicate electric measuring instruments are connected up. Then the person is asked to relax; then to think; then he is excited in various ways. A little tracer marks a tell-tale curve, and very, very interesting scientific data are being accumulated -- data which may well be revolutionary. The science editor in a leading New York paper commented that these experiments had as yet advanced only a little way, that the scientists themselves were very reticent in the conclusions which they were prepared to draw, but that it was safe for us to assume on the basis of these experiments that we can "reduce consciousness to electricity".

Now, that idea that once you have measured something you have got the whole thing -- that nothing matters except what you have measured -- is one of the dangerous delusions of our generation and of our age. Indeed, I think you could make out a pretty good case for saying it is that obsession which is responsible for most of the catastrophes that now overhang the world.

Extreme behavioristic and materialistic psychologists say consciousness never exists except in connection with physiological processes -- that every psychological event has a physiological correlate. Every time you think, what really is happening is that a current passes between the synapses between two neurones.

Let us just examine that idea. The real thing in the world is matter, these nice solid things, these things you can touch. If a thing is intangible, that means it is not real, you can't touch it. Seeing is

believing, the old idea that the senses are the only way in which we can get data.

Eddington and various other scientists have been telling us that we have been deluded about that. This desk actually is nothing more than a kind of fog of electrons and protons and a very thin fog at that.

Recently I saw a statement that if one takes a block of solid matter and shoots an electron through it, that electron will on the average go twenty miles before by accident it bumps into an atom. Matter is as thin as that. Or, put it another way, Eddington said if we collected together all the solid matter in a human body it would make a particle about as big as a pin-head. That is all the solid matter there is in you; the rest of it is vacancy. When I think my hand touches this desk, it is just a swarm of electrons very widely spaced coming into contact with another swarm of electrons.

Back there are a couple of doors that look red to me. Well, what is redness? Are those doors really red? Oh, no. All we can say about those doors is that they are the source of certain light waves which have a certain rapidity and if they were a lot more rapid or a little less rapid the color would be different. Similarly with cold and heat or rough and smooth or sweet and sour; it is a question of vibrations. The experience itself must be up in our heads.

The psychologist has gone farther than that. He says we may liken the individual to a man in a dark chamber with no windows and no doors -- the chamber of the skull. Into this dark chamber there come messages over various wires, like telephone and telegraph wires (we call them nerves) from the eyes, the ears and the fingers. This man in the dark chamber draws conclusions about the outer world, but he knows nothing about it directly. We can go farther than that. How do you know that there is any dark chamber? Well, you can rap on it and hear a noise, but that is just sound vibrations. You can feel of it with your hands, but that is just tactual vibration. You don't even know there is a dark chamber of the skull.

Well, this begins to get rather agnostic as they say -- a bit skeptical. Can you prove to me that you are not at this moment, that you are not in the midst of a very vivid dream? There is no use pinching yourself; that might be part of the dream. How do you know that you are really here at a lecture -- that that isn't merely an idea that has been suggested to you by a clever hypnotist? You may be up on the stage in front of an audience instead of being an audience. You may be just sitting there with a kind of blank expression because the hypnotist has deluded you. In other words, when we begin to examine critically the basis of our knowledge, we are driven back to a very ancient minimum. The old philosopher said a long time ago that all we can be really sure of is "Cogite ergo sum", which means "I think, therefore, I am". I am a little more skeptical than that; I am not quite sure about the "ergo sum".

Now, let's start from this abyss of skepticism and see what we can build up. Perhaps from that we can get some idea of the psychology of the future and of the discovery of ourselves which may emerge out of that future psychology.

Let me take this consciousness, this cognition which is the basis of my knowledge. First, I find that my consciousness has a time dimension. I not only think, but I am aware of the fact that I did think in the past and I am aware of the expectation that I shall think in the future; therefore, I speak of my "stream of consciousness".

One man to whom I used that phrase got quite irate and said that it is terribly oldfashioned. If you don't like it I might speak of "a sequence of configurations". Personally it is a little bit easier for me to use the phrase "stream of consciousness". All I know is this conscious stream. Matter, as Eddington pointed out, is a remote inference -- it is something men figure out to try to explain their consciousness.

I want to carry out with you a little experiment. This is a bit rash but I am going to ask you to cooperate because this experiment is part of the lecture, and I think it will illustrate the point. I am going to ask you to put both feet flat on the ground. If you have anything on your laps please put it on the floor. Let your hands fall loosely upon your knees. Before going farther, I am going to tell you what this procedure is really for -- it is to offer you an objective experiment by means of which you can divide your stream of consciousness into two fundamentally different parts. That fundamental difference in our stream of consciousness is crucial in what I have to say to you today.

Now, leave your hands loose on your knees. Please close your eyes if you are not afraid. Now, I want you to let go, to relax. It is a hard job to relax. It really takes at least ten minutes. Begin letting go of your body. Let go of your feet; don't push the floor down, let the floor hold your feet up. Let go of your hands. I want your hands to be as limp as wet oak leaves on the trunks of fallen trees in a forest. Let go of your faces, let go of your foreheads particularly. Let your foreheads become calm and serene like a pool in some forest stream where the current has ceased to flow and where the breezes have died down till we have a glassy surface reflecting the trees and the sky and at long last the stars.

Let go of the puckers around your eyes, and the tensions in your cheeks. Think of your whole body as becoming inert like a sack of potatoes. As you progressively proceed to let go of your bodies, I want you to ask yourself inwardly this question: "What part of your stream of consciousness can remain after you have shut the channels of senses as far as you can under these circumstances?"

While you are thus relaxed, with your eyes closed, I would like to have you call up an image of the place where you live. Call up an image of yourself entering the door. Look at it as it looked to you this morning. See if you can see the people there whom you know. Now, I want you to imagine yourself going into that home at the end of this lecture. Imagine how it will be. Imagine meeting a stranger there. Now, with your eyes still closed and still relaxed I want you to go farther in this exploration. I want you to imagine Henry Ford up here on the platform dancing a highland fling. Lastly, I want you briefly to say over part of the multiplication table in your mind. All right, now if you open your eyes we can proceed with the lecture.

This process of relaxation and of shutting off the channels of senses, of course, was only approximate. You had to have your ears open. But you can go home, or go to some place, such as a church that is open for meditation, and go through this process of relaxation. If necessary, stuff some cotton in your ears; pull the shades, and if necessary put a bandage around your eyes. Cut off the channels of the senses as much as may be, and you find you still can carry forward a large part of your stream of consciousness. We will use that for a basic definition. The part of your consciousness you have excluded we will call "the sensory world" and the part which can still go on after you have cut off the channels of the senses we will call "the inner world". That is a definition, mark you, which is based upon an experiment. Let's see now what deductions we can draw from our brief and very informal experiment.

What is there in this inner world? In the first place, there is a world of inner images. You can imagine things. Some of these images relate to the past. We must note that all of our conscious contact with the past has to be through the inner world. But it is possible for you to recombine them in novel ways. You can bring up fresh images into mind.

Now, let me call attention to another theory. I asked you to remember people that you know. Someone you love may have come up into your inner images. If you try the experiment you will find you can bring up very vividly in this inner world the sense of love of people who are near and dear to you, and for that matter, you can bring up unpleasant experiences. Our values, then, belong to this inner world.

In relation to this whole question of behaviorism, empiricism and the general materialistic point of view, let me put a question. Supposing that you had to choose -- you could have either the sensory world or the inner world. Which one would you take? Now, one thing should become evident to you as you think about that. If you give up the inner world, the sensory world would promptly become worthless. You are listening with apparent attention to what I am saying, but these words of mine would be utterly meaningless except as you carried forward the results of past experience, the associations of these words. Meaning has to do with our recollection of past experience, conscious and unconscious. The same thing is true of seeing as well as of hearing. A human face

would be a meaningless blotch of various colors and shapes unless we had memory with which to interpret it. You can, therefore, say that the inner world is important fundamentally because it has in it our hopes, our plans, our values, our creativity. But it is supremely important because without it we could not experience the sensory world -- and the outer world, if there is one.

Let us go farther forward with this. I spoke about the inner world as being the source of creativity. Here is this room in which we are gathered and the building of which this room is part. How did this room and this building begin? When you stop to think about it you know that this room began in the inner world of an architect, or perhaps in the inner world of the Secretary of Agriculture or whoever it was that began thinking about the necessity of a building like this with an auditorium like this in it. This room began as an imaginative picture; then it was reduced to sketches in two dimensions; then at long last after those sketches had been revised, there was an external sketch, a three dimensional sketch made in steel, stone, plaster, paint. What is the purpose of this three dimensional sketch? Only that you may have certain experiences inside, certain sensory experiences which you have to interpret in the inner world. Creativity then starts in the inner world, whether one is an architect, an artist, a musician, a poet, a novelist, or a short story writer. Anyone who produces works of art has first to conceive them in the inner world.

I want to go a little farther about the significance of this world of inner images in our lives. Let me tell you a story which you can put in the believe-it-or-not category. Some years ago in New York there was a lawyer called Henry Brown. This lawyer had a very vivid dream one night. He dreamt that he was in an alley, that he was being assaulted by a short, stocky ugly looking man. This man had thrown him to the ground, was sitting on top of him and was trying to choke him to death. Mr. Brown struggled in his dream, trying to loosen the grasp of his assailant. Finally, he managed to push him off, so that he could get a breath of air in his lungs again. At that moment he saw two of his friends. They rushed in to save him but before they could reach him, the man sitting on top of him brought a hatchet down and chopped his head open. He then noted that his friends had gathered around the corpse and were weeping and wailing over the remains. Thereupon he woke up.

The next day, he happened to meet the man who was the foremost of his rescuers. He said nothing at all about his dream but the friend said, "Oh, Mr. Brown, I had the most ghastly dream about you last night. I dreamt I was walking down the street when I heard cries. I rushed into an alley and there saw you lying on the ground with a short man on top of you. He was choking you to death. He then seized a hatchet and chopped your head open."

A week later, Mr. Brown happened to visit the home of the other

of his two leading rescuers. These rescuers didn't know each other in the outer world. As Mr. Brown came in, the wife of his second rescuer started off saying, "My husband had a terrible dream about you. He dreamt there was a man beating your brains out with a club." The husband said, "No, no -- with a hatchet, my dear."

Here then were these three people dreaming the same dream all at the same time in which each of them occupied their appropriate parts. Grant that the dream might be true. If you find that very difficult, I suggest that you look up an article called "Visions and Apparitions, collectively and reciprocally perceived". It is in the Proceedings of the (British) Society for Psychical Research, May, 1932. You will find some other similar cases there.

If this kind of thing is really true, where did this dream take place? Was it in Mr. Brown's head, or in the head of the first rescuer, or of the second rescuer, or in an alley in New York City or outside of time and space? It really doesn't matter. The crucial thing we must recognize is that if this kind of thing can happen there can be a realm of reality different from our outer sensory world.

Earlier in this course, you heard Dr. J. B. Rhine, of Duke University. He spoke on telepathy. Dr. Rhine is a very courageous explorer. His work fits in with and carries forward other scientific work in this field. If you are ready to accept telepathy as a tentative hypothesis, connect up telepathy with dreams, and the kind of thing I have just related to you becomes perfectly natural and normal. That is to say, if telepathy occurs, this kind of world external to physical reality may be actual, and it may be possible for two people to meet in that strange realm, to converse with each other, to give each other information, to have new experiences and to come back again into this world carrying more or less clearly the memory of that epochal experience.

Now, of course, if that sort of thing is true, it opens the door to a whole realm of research. I am not asking you to believe that it is true. I am suggesting to you that you look at this as a doorway into a possible kind of reality which if it turned out to be real would be revolutionary in its implications. Let's suppose that an American Indian who was accustomed to going out hunting, lay down to sleep. He dropped into a vivid dream. In this dream he paddled his canoe down a stream, pulled up his canoe on a sandy beach, went through a cleft in the rock into a dell, pursued a deer, shot it, built a fire, cooked some venison and woke up. Let's suppose next time he did this another friend of his was asleep. By telepathy this first Indian was able to bring his friend into this same dream, paddling down the river, landing on the sandy beach, going through the rock, pursuing the deer, shooting it, building a fire and cooking venison. Suppose these two Indians went exploring across the hills. You have a basis there for the creation, at least in the dream world, of what has been called the happy hunting ground.

If you want some very beautiful fictional treatments of this idea, let me suggest Rudyard Kipling's short story, "The Brushwood Boy". Or the novel, movie and opera called "Peter Ibbotson". Both of them enlarge on this idea.

Let's go on. This inner world includes not only images. I suggested to you that you should repeat part of the multiplication table in your mind. Why was that? I wanted to call your attention to the fact that there is in the inner world another level of experience, a level which we might call the realm of abstract words. If you say such a thing as "Beauty is truth, truth beauty; that is all we know and all we need to know", you are dealing with the realm of abstract words. If you say "That Government of the people, by the people and for the people shall not perish from the earth," you are talking again in terms of abstract words. Now, this realm of abstract words is part of the basic reality of the inner world. It is a part which isn't very fashionable at present with behavioristic psychologists. It is a part which has been considerably neglected even by many of our scientists. It is the realm of philosophy. It is the realm of logic. That realm also needs to be further examined.

Certain general facts about the inner world which we need to put down as fundamental at this point: Let us take the world of inner images to which, of course, your world of dreams belongs. One of the very extraordinary things about that world is that these images arrange themselves into patterns. When you dream a dream, who makes up the plot? Now, the more you think about that the more elusive and baffling the question is likely to become. Somebody makes up a dream which to you is startling and surprising. It comes from somewhere. When you dream this dream you are passing through some sort of a more or less orderly pattern of images.

Now, that sort of thing can be used creatively. Robert Louis Stevenson, when he was hard up for a plot for a story, used to lie down and, he said, turn the job over to "the little people" -- namely, whoever was in charge of his dreams. He would then go to sleep, whereupon the little people would put on a play for him. He would see an extraordinary series of events. Then when he woke up, he would take that series of events and put it into a story and sell the story. For example, Dr. Jekyll and Mr. Hyde arose out of that process, so he tells us. There is, then, some kind of organizing process at work in this world of inner images.

How about the world of abstract words? Who invented Latin grammar? I have known some highschool boys who would rejoin to that, "I would like to catch him alone in an alley". But who did invent Latin grammar? You might suppose it to be the fellow who wrote the grammar you studied in highschool. But no, there were Latin grammars in the time of Caesar. Who made up the first grammar? Now some old Roman grammarian; he simply put down something that was there already. One of the interesting things

that the anthropologist tells us is that if you go out and study the language of primitive people, you find that this language has nouns, verbs, adverbs, and adjectives; it has sentence structure, and grammatical rules even though the primitive people are ignorant of the existence of such a thing. Grammar and logic are part of the inherent pattern-producing process of reality.

Process works in inner as well as in the outer world. Take snow crystals, tulips, rhododendrons, the body of a newborn child or the growth of a city. All these illustrate the pattern-producing process in the world of abstract words.

That discovery is of great importance practically. Suppose you are the kind of person who has to write reports, or who does research work, or who has to do creative work in any line. You perhaps sit down and struggle. You toil and tussle, you twist and strain and try to bring about some sort of organization in your material.

Suppose you have a mass of data, whether it is statistical items, human experiences or a body of field observations. You don't know how to organize it. Confronting your data, try the experiment of relaxing completely, as we did a little while ago. Do it better than you did it then. After you have become deeply relaxed, call up your research problem. Explore it a little bit -- just let your mind roam around in it, with no effort except to keep your attention on it. If you are able to hold your attention on the subject for at least fifteen minutes, you will probably find that the material begins to take on orderly arrangement. You begin to see an outline emerge.

Perhaps you can do the same thing if you sit at a typewriter or hold a pencil. But the more relaxed you are, the more you will turn loose this basic organizing process, and the more successful you are therefore likely to be. Now, of course, you can't substitute this relaxation for the process of getting data. A good many mystics have tried that and the results have been very discouraging. But if you gather your data faithfully and then learn to turn on this basic process of your inner nature, you will find that you can go far beyond what you can do deliberately and by conscious effort. Try it!

Inner reality has still another level -- a level which is more significant and yet which is likely to be more baffling than either of the other levels of which I have spoken. This is the level of reality which is beyond images and beyond words. Let me begin by adducing psychological evidence that such a level exists. If you look in the Archives of Psychology, back in the year 1922, you will find a monograph by Dr. Ruth Clark of Columbia University, entitled "An Experimental Study of Silent Thinking". Now, Dr. Clark first did the thing that all good Ph.D.'s do: she studied the literature in the field. She went over the

investigation of about a dozen psychologists, some of them eminent, scattered in various parts of the world, who had studied this question of silent thinking. Emerging from these previous studies she found this conclusion; images are not necessary to thought.

She then took a lot of victims such as psychological Ph.D. candidates gather from their fellow students. She took them one by one into her laboratory. She had them sit down and relax. She fastened various kinds of instruments on them. She had kinetographs recording those waving lines. She had her victims introspect, retrospect, and push buttons -- she did the various things psychologists are supposed to do in the most scientific manner. Finally, she came to this conclusion: when you put a problem up to people under these circumstances, creative thinking frequently takes place without images and without words. She said this is likely to occur when the body is completely passive. This process of creative thinking takes place so swiftly that it takes a good deal longer to talk it or write it out than to have it occur.

There is then a realm of the inner world which is beyond words and beyond images. Well, what of it? I think we shall find that that is the most significant realm of our consciousness. It may be that there is where our true self resides. Let me illustrate that a little more elaborately. When you are holding a conversation next time, introspect a little bit. You may probably bawl up the conversation but it is worth it. What are you thinking about while you are conversing? If you are a lecturer, you will find you have to do this sort of thing all the time. You will find that you are thinking partly about the word you are uttering, but that is not your main focus of thought. You are thinking about the rest of the sentence which is still to be uttered, and you are thinking also about some ideas that haven't been clothed in words.

Some of you may perhaps have had the experience of killing the hen that you thought wasn't laying and then finding she had an egg inside that had a shell already on it, another ready to have a shell, and back of that in the Fallopian tube a series of yolks, getting smaller and smaller until they were mere rudiments.

That is the way your mind is when you are talking. The egg with the shell on is the word you are uttering, but back of that there are unuttered words, and back of these there are ideas which haven't yet been clothed in speech. They belong to this remaining level of the inner world of which I am talking.

Let me give you another proof or illustration. Suppose that you looked at some building, let us say the Lincoln Memorial, and somebody said to you, "Isn't that a beautiful building?" You answer, "Yes, it is very beautiful." Or perhaps you say, "I think it is rather an abortion!" How do you know? You don't decide by looking up in a book some rules about architectural proportions. You don't decide merely by calling up mental pictures of the Parthenon and saying this isn't like

that or this is like that. You have in your inner consciousness an awareness of beauty -- some standard of beauty that is beyond images and beyond words; you check the Lincoln Memorial against that wordless and imageless reality.

One more illustration of the actuality of this higher level of our inner world. Suppose that you are trying to explain to someone some fundamental principle, say the principle of diminishing returns, or the principle of the threshold of acuity in consciousness or of after-images in vision, or of plateaus in the learning curve. You start out with a certain set of words and illustrations. The person's face is perfectly blank. You take another set of words and they are still blank. Perhaps your friend is an Italian or Frenchman. You are able to speak his language. Instead of talking English, you painstakingly translate. Still his face is blank. Maybe you get some mutual friend to act as interpreter and put it into Russian for him. Still he does not seem to see. Then suddenly his face lights up. Then he tells you the story with an entirely new set of words and new illustrations, and you say, "Yes, now you have it!" But what is "it"? It is not words; it is not images, because you have used all sorts of illustrations. It is an idea.

One of our great blunders has been to equate ideas with words. They are basically different. We have to go way back to Plato to get the real meaning of that and Plato only got a fraction of it. The real meaning is the reality beyond words and beyond forms.

How would it be if upon careful inquiry we discovered that this wordless and imageless level is the place where you really live? If that is the case, it might be that all of our psychological researches thus far have been merely explorations on the periphery of the subject. We have been doing the easiest things first. It is much more easy to measure discrimination between green and blue than it is to get at the subtle realities of this wordless and imageless level of consciousness. It may be there is the place where our real problems lie. There is the place where our real discoveries are to be made.

Who are you? Now, I don't want your name. I don't want your photograph. I don't even want to know your occupation. I want to know who you are. Who would you be if your mother had married somebody else instead of your father? Would you be your mother's child? Would you be your father's child? Would half of you be in your mother's family and half in your father's family? Would you be born to some other family entirely? Would you never have come into existence at all? Who are you?

Here in this world there are about two billion people. One individual out of all those two billion is unique. You call that one person "I". And all the others you call "you" or "they". Why that freak of nature? Why that peculiarity that there is one person in the world who is different from all the others, and you are it?

Think back to the earliest recollection that you can recall, back perhaps to the time when you dropped your bottle out of the slats of your crib, or the time when your father was tossing you up in the air -- or you were toddling along beside him and thinking what a wonderful demi-god he was. Take the earliest thing you can remember, when you were a little chubby child. Now, look forward to the time when, if you live long enough, you will be one of these tottering folks -- still there will be something of this same you flaming up inside of that body, perhaps struggling to get out of that defective mechanism. What is this "I"? Obviously it is not your body. Is it your inner images? Is it your memories? Is it your purposes? Notice you have called them yours. I am not interested in the property; I am interested in the proprietor. Who are you -- this innermost self of yourself. Perhaps you are your emotions, your desires, yet we are still saying "your". I want that innermost focus of consciousness that you call you.

Here is a man who enlists in the army or navy. He goes away to camp. He has to leave his civilian clothes behind. He has to put on a new outfit. He lives in new places to which he is unaccustomed. He doesn't see his old friends. He is no longer dishing out sugar and potatoes across a counter; he is dishing out shot and shell. He has made up a whole new set of attitudes, interests, expectations. Yet there is the same person, the same identity at the core of this individual.

Now, if we are going to find our real selves, we of course need to understand the envelopes. We need to understand the body, we need to understand the images, we need to understand the ideas, the attitudes, the purposes, that have clustered around ourselves. But are not all these things a good deal like a Japanese lantern with a flame in the center? The flame gives meaning to the whole lantern. Or, take another figure of speech, perhaps we may find that our personalities,--we live in a series of different personalities as we grow up, as we get married, as we change our occupations, as we move from one town to another; this group of personalities that we take on, and those imaginary personalities that we take on when we read a story with enthusiastic interest or look at a play and put ourselves in the place of the hero -- all these personalities, perhaps, are simply the parts that we are playing in a cosmic drama.

Conceivably we may discover at long last that our real self is not the character that we are playing, not the hero or the villain or the person who has perhaps only a minor part in the drama. The real I may prove to be the actor who plays the part and conceivably, at long last when our last line is spoken we might rub off the makeup, lay aside the costume and go out through the stage door into a wider world, over-arched with stars.

Such is the belief of some people who have spent long years studying these problems of the inner world. As you confront these bizarre lines of psychological research, you may begin to ask, "After all, is

this mere fantasy, such stuff as dreams are made of? Or is it perhaps a new realm of reality, which may have transcendent importance in human life as the years go on?" You may then be inclined to inquire into the question, "How does the world find truth?"

Steinmetz, the wizard who worked with the General Electric Company for years for the love of inventing, was asked a question. Somebody asked him what were going to be the great discoveries of the years to come. I suppose the questioner thought Steinmetz was going to talk about projecting power by radio or about some marvelous new method of transportation to the stratosphere. Mr. Steinmetz said the important discoveries of the future are going to be in the realm of the spirit. When we begin to apply to these fundamental questions of the human soul, of faith, of religion and of prayer, the methods of the laboratory, then our real discoveries will begin to come.

Does that seem absurd to you? How is truth born? Look in the Encyclopedia Britannica, in the volume where the article on "Maps" appears. In that article, find the map that was created by Ptolemy about the year 90 B.C. It was rediscovered in Europe about 1470 A.D. If you look at that map, you will find three zones in it. They are not marked, but you will be able to distinguish them. The central zone is the Mediterranean Sea and the immediately adjacent countries. There is Italy, the familiar boot kicking Sicily off its toe. There are the familiar isles of Greece and the Delta of the Nile; there is the familiar blocky form of Spain. Yes, the Mediterranean Sea looks as though it had come from a modern map. In the ancient days the mariners and the astronomers had made very careful measurements; they had geometry, and they worked the thing out scientifically. Around that first zone you will find a second. On it you will observe the British Isles, all twisted out of shape. You will find that Norway and Sweden are represented merely by little dots labeled "Insulae Scandiae". You will find that India, which ought to be a great peninsular sub-continent, has shrunk up to a little pimple, and Ceylon, which ought to be a little isle, is almost as big as though it were a continent. Why are these things? That part of the map was drawn in approximately on the basis of travelers' tales. You find a third region of the map where everything is missing entirely; nobody knows about the Western Hemisphere or Australia.

There is one strange thing about this map. It was devised in 90 B.C., nevertheless, it shows that the one who made it thought of the world as a globe. How did he know that? It was a philosophical speculation. Some of the philosophers had seen that the shadow of the earth on the moon was circular. If they looked at the stars in Greece, they saw a different set from what they saw in Egypt. When a ship put out to sea, the last thing to be seen was the spars and not the hull. These philosophers put two and two together. They speculated that the earth is a sphere.

A man called Columbus who saw that resurrected map of Ptolemy talked it over with his friends. I expect that some of them were

behaviorists or positivists. They said; "India is pure hearsay, there probably isn't such a place. You think you are going to sail around the world, but that idea about the world being a sphere is a mere speculation by a philosopher. Keep your little boats in the Mediterranean and be safe. There at least you have good maps and charts!"

Don't you wish he had? You would probably be Italian peasants. No, Columbus got in his little boats and he sailed out through the Pillars of Hercules. He dared as though the philosopher had been right. He dared to act as though the travelers' tales were real. He stumbled on something unexpected -- he stumbled on a new world. So you and I live in an age when behaviorists are saying; "Stay in the safe portion of psychology where things have been well measured. Keep your little ships in the places where the charts are reliable. Don't go out in this world of psychical phenomena and occultism and all of those dangerous things. No, no! Play safe! Stay inside!"

All right, you can if you want to. But some of us are going to climb into our boats. We are going to fare forth between the Pillars of Hercules. We are going to dare to act as though these rumors had some foundation. We are going to dare to explore. Perhaps we will sink without leaving a trace; perhaps the monsters of the deep will devour us. But perhaps the prows of our ships may ground on the coast of some unexplored shore. Perhaps we may find new realms infinitely greater than those we have known. Perhaps we may take steps forward into the discovery of the infinite mystery of reality.

NOTE

We regret that it is impracticable to make available for publication the lectures of Dr. Mark May on "Measuring Personality" and of Dr. Sandor Rado on "Exploring the Unconscious".

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